The Tomb of two Brothers

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Manchester Museum

MUSEUM HANDBOOKS

Tomb of Two Brothers

BY

MARGARET ALICE MURRAY

with contributions by

RON, Dr. PAUL HAAS, Prof. H. B. DIXON, F.R.S., and E. LINDER, B.Sc.
AAS W. FOX, M.Sc. and Prof. JULIUS HÜBNER, M.Sc., Tech.

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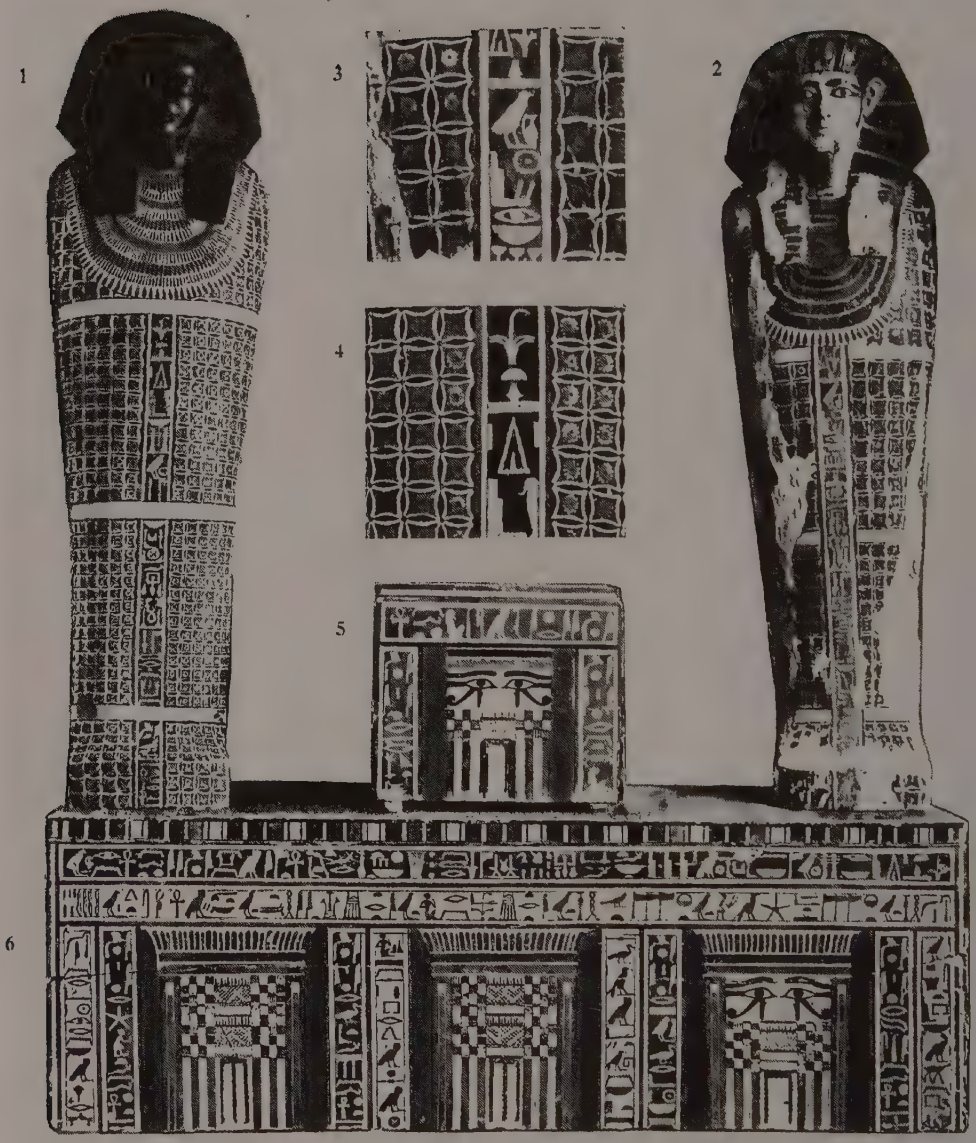

MUMMY CASES OF KHNUMU-NEKHT AND NEKHT-ANKH.

1. Body-case of Nekht-Ankh.
2. Body-case of Khnumu-Nekht.
3. Hieroglyphs on Body-case of Khnumu-Nekht.
4. Hieroglyphs on Body-case of Nekht-Ankh.
5. Canopic Chest of Nekht-Ankh.
6. Coffin of Nekht-Ankh.

The Manchester Museum.

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BY

MARGARET ALICE MURRAY.

REPORT ON THE ANATOMY OF THE MUMMIES
By Dr. JOHN CAMERON.

REPORT ON THE CHEMISTRY OF THE REMAINS
By Dr. PAUL HAAS, Prof. H. B. DIXON, F.R.S., and E. LINDER, B.Sc.

REPORT ON THE TEXTILE FABRICS
By THOMAS W. FOX, M.Sc.

REPORT ON THE COLOURING MATTER OF THE TEXTILES
By Prof. JULIUS HÜBNER, M.Sc. Tech.

MANCHESTER: SHERRATT & HUGHES, ST. ANN ST.
LONDON: DULAU & CO., 37, SOHO SQUARE.

PREFACE.

IN the summer of 1907, a letter was received from Professor Flinders Petrie announcing that a tomb group of the XIIth Dynasty had been discovered during the previous season at Rifeh in Upper Egypt, consisting of two painted sarcophagi with body coffins and mummies, two perfect boats with sailors, a canopic chest finely painted with all the contents complete, and five statuettes, all of the best work. Professor Petrie emphasized the importance of the whole group being kept together, and stated that, if the Manchester Museum could see its way to contribute the sum of £500 to the coming excavations at Memphis, his Committee would allot to it this group, and give it a first claim on the results of that excavation. Much interest was shown in the matter, with the result that the sum of £570 19s. was raised in a few weeks.

The Museum Committee is greatly indebted to the following ladies and gentlemen for their generous help in providing this fund :—Mrs. Thos. Ashton, Miss M. Hart-Davis, Miss Caroline Herford, the Rt. Rev. the Bishop of Salford, Sir William H. Bailey, Sir William Mather, Aldermen Edward Holt, W. T. Rothwell, John Royle, Professor Arthur Schuster and Messrs. W. L. Behrens, Max E. Cohen, W. Ferguson, F. Godlee, Jesse Haworth, C. T. Needham, J. R. Oliver, James Watts, and G. S. Woolley.

With their approval the balance of the sum raised, amounting to about £70, has been applied in the production of the present Memoir.

A large number of workers have collaborated in its preparation, and their names will be found recorded in the table of contents and elsewhere. Professor Flinders Petrie has kindly read the proofs and made a number of helpful suggestions. In addition help has been given in various ways by Mr. F. W. Bailey, Mr. W. Bennett, Miss W. M. Crompton, Miss M. Hart-Davis, Mr. R. Standen, and the Misses K. and E. Wilkinson. Dr. Walker and Mr. F. Ll. Griffith have aided in translating the inscriptions.

Photographs have been supplied by Messrs. Wm. Greenwood, J. Wilfrid Jackson, J. Rhoades and Professor Flinders Petrie, whose initials are subscribed to the various plates where their contributions appear.

The blocks for a large number of the plates have by the kind permission of Mr. J. H. Reynolds, Director of the Manchester School of Technology, been prepared in the Photographic Department of that Institution by Mr. C. W. Gamble.

To each and all of these workers the Museum Committee desires to acknowledge its indebtedness and trusts they will find their reward in the appreciation of their work by students of Egyptology in the present and the future.

W. M. Hoyle.

March 20th, 1909. Director of the Museum.

TABLE OF CONTENTS.

PAGE

INTRODUCTION 7

THE TOMB 9

THE TOMB FURNITURE 11

NEKHT-ANKH.

The Coffin 11
The Body Case... 12
The Canopic Chest 13
The Canopic Jars 13

KHNUMU-NEKHT.

The Coffin 14
The Body Case... 14

THE SMALL OBJECTS.

The Statuettes 15
Statuettes of Women 16
The Boats 17
The Pottery 18

THE INSCRIPTIONS.

Coffin of Nekht-Ankh 19
Body Case of Nekht-Ankh 23
Canopic Chest 23
Statuettes 25
Coffin of Khnumu-Nekht 26
Body Case of Khnumu-Nekht 30

THE MUMMIES.

Nekht-Ankh 31
Contents of the Canopic Jars by Dr. John Cameron 31
Khnumu-Nekht 32

6. The Anatomy of the Mummies by Dr. John Cameron.

The Skeleton. PAG

The Approximate Age 3

The Stature 3

The Skulls 3

Vertebral Column and Appendages 3

The Viscera 4

7. The Chemistry of the Remains.

Report on the Inorganic Constituents by Dr. Paul Haas 4

Note on the Salt found with the Mummy of Nekht-Ankh by Professor H. B. Dixon, F.R.S. 5

Analysis of Mummy Dust of Khnumu-Nekht by Dr. Linder, B.Sc. ... 5

8. The Bandaging 5

9. The Mummy Wrappings.

Report on the Textile Fabrics by Mr. Thomas W. Fox, M.Sc. ... 6

10. The Colouring Matter of the Mummy Cloths by Professor Julius Hübner, M.Sc. Tech., F.I.C. 7

1.—INTRODUCTION.

To the General Reader.

TO most people there are few ideas more repugnant than that of disturbing the dead. To open graves, to remove all the objects placed there by loving hands, and to unroll and investigate the bodies, seems to many minds not merely repulsive but bordering on sacrilege. And yet these same people would not hesitate to wear a scarab-ring taken off a dead man's hand; they willingly buy strings of beads which were found round a mummy's neck; they will handle without a qualm the amulets that were found actually inside a body. In short they encourage, for their own pleasure and amusement, the rifling of graves for gain by the natives. To such people I have nothing to say. Their objections—their opinions even—are an offence to science. To those, however, whose objections are not of the purely sentimental kind (dictated by a momentary feeling passing through an otherwise vacant mind) I wish to offer a short explanation of the reasons for the action of archæologists throughout the world.

Archæology has been raised to the rank of a science within one generation: before that it was merely the pastime of the dilettante and the amateur who amused himself by adding beautiful specimens to his collection of ancient art. Then came the period of the enthusiast in languages, to whom inscriptions were the joy of life. And now there has arisen a new school to whom archæology is a science, a science which embraces the whole field of human activity. Archæology, in other words, is the history of the human race. It is a science which contains within itself all other sciences. The new sciences of psychology and comparative religion owe their being to archæology, and history itself is merely archæology in a narrow form.

The acquisition of knowledge has been the great aim of humanity since the beginning of time; knowledge of the material world, and knowledge of the spiritual world. Every science is assisted forward by the records of the past, but I choose only four out of the number, to speak of: (1) psychology, the science of the mind, depends entirely upon archæology for its knowledge of the growth of ideas; (2) the science of comparative religion could make no headway without the aid of archæology; (3) the science of ethnology could not be carried on without

archæology as a foundation; (4) the science of comparative anatomy is helped forward by archæology.

Archæology can assist these four great sciences only by opening and examining graves and their contents. It is only by a knowledge of the objects placed with the dead, and by the methods of burial, that we learn the ideas of early races as to a future life; by studying these graves in chronological order we trace the growth of ideas and the evolution of religion and of the philosophy of life. By an examination of the bodies, the knowledge of the ethnologist and the anatomist is immensely increased.

The History of Civilisation embraces all sciences for it is the History of Mankind; and every vestige of ancient remains must be carefully studied and recorded without sentimentality and without fear of the outcry of the ignorant.

Prof. Flinders Petrie gives another argument in his "Methods and Aims in Archæology" (pp. 180-2): "We must always have regard to what may be the condition of knowledge five hundred or five thousand years hence. For if you will deal with thousands of years you must take thousands of years into account. To ensure the fullest knowledge and the most complete preservation of things should be the real aim. To raid the whole of past ages, and put all that we think effective into museums is only to ensure that such things will perish in course of time. A museum is only a temporary place. There is not one store-house in the world that has lasted a couple of thousand years. Broadly speaking, there is no likelihood that the majority of things now in museums will yet be preserved anything like as long as they have already lasted. It is then to the written record and the published illustrations that the future will have mainly to look."

And again in his "Royal Tombs II.," p. 17: "The printed description distributed in all the libraries of the world will last far longer than the objects themselves. To leave important remains without any diffused record is a crime only exceeded by that of their destruction."

And we who stand merely on the threshold of knowledge are only dimly aware of the value of our work as the foundation of the splendour of knowledge which is the heritage of those who are yet to come.

2.—THE TOMB.

ABOUT eight miles south of Assiut are the rock-tombs of Der Rifeh, the cemetery of the ancient Egyptian town of Shas-hotep. The Greeks called the city Hypselis, and Shatb is probably the modern form of the more ancient name. The local deity was Khnum, the ram-headed god, whose worship continued till Roman times when coins struck at Hypselis bear the figure of a ram.[1] Brugsch identifies this ram with Osiris, and considers Khnum of Shas-hotep as a local form of Osiris.

In the cliffs of Der Rifeh are the rock-tombs of the XIIth dynasty. The inscriptions of the most northern tombs are published by Mr. F. Ll. Griffith in his "Siut and Der Rifeh;" some of the southern group are published by Prof. Flinders Petrie in his "Gizeh and Rifeh."[2] In this latter group the most northern was a large unsculptured tomb, which is dated, by the style alone, to the XIIth dynasty. It consists of a large open court, which is cut in the side of the cliff and from which a short passage leads into a great hall; two smaller chambers lead out of the hall. The only written record in the tomb is an inscription of the time of Rameses III., written in ink on the south wall of the great hall, showing that the tomb must have been re-used at that period.[3]

The open court was cut in the steep sloping side of the cliff, the sides and floor being of the living rock roughly smoothed, and the floor was covered with the débris, which had fallen from the cliff, to the depth of about eighteen inches. Part of the work of the excavators was to remove all the rubbish so as to expose every inch of the surface of the floor. On the last evening of working in that neighbourhood, when Professor Petrie had already gone down-country and the camp was in charge of Mr. Ernest Mackay, there was found a tomb in the S.E. angle of the court (Pl. 2, fig. 1). The finder was a workman from Quft, named Erfai; but unfortunately Mr. Mackay was not called until the passage was partially cleared; there is, therefore, no record of the method by which the entrance to the passage was concealed; whether it was filled with rough blocks

(1) Brugsch, Dict. géog. 795.
(2) Petrie, Gizeh and Rifeh, pls. viii., xiii.E., pp. 11, 12.
(3) Petrie, Gizeh and Rifeh, pls. xxviii.-xxx.

cemented together to look like the rest of the floor or whether the original owners trusted to the débris covering the entrance and so preserving the tomb from tomb-robbers.

The entrance was two metres from the side of the court and sloped till it was one-and-a-half metres below the surface. It was filled with limestone chips and rubble. The entrance of the tomb was blocked with a dry-walling of small limestone blocks hardly larger than pebbles. (Pl. 4, fig. 1).

The interior of the tomb-chamber was so completely filled with tomb-furniture that it was impossible for any but a small boy to get inside, consequently the positions of the small objects, as given in the plan, are approximate and not absolutely accurate.

The tomb was hewn in the living rock; the walls, roof and floor being roughly smoothed. There were no inscriptions of any kind.

An account of the tomb with figures of the coffins and tomb furniture and reproductions of the inscriptions will be found in Professor Flinders Petrie's Memoir, "Gizeh and Rifeh," pp. 12 and 27, pls. XA—E, XIIIE—II.

3.—THE TOMB FURNITURE.

WITHIN the tomb were two coffins standing side by side, that of Khnumu-Nekht being against the wall (see plan, Pl. 3 and Pl. 4, fig. 1). The heads were towards the entrance, *i.e.* as nearly north as the position of the tomb allowed.

At the south of the chamber, standing by the feet of Nekht-Ankh was the chest containing the four canopic vases. Two boats and two figures of offering-bearers stood on the floor in the open space beside the coffin; the statuettes of the men were inside the coffins.

The coffins are of wood, put together with wooden pegs. Inside the coffin-lid at each end is a transverse bar of wood pierced with two holes; two holes were also bored in each end of the coffin, so as to come exactly opposite the holes in the transverse bar when the lid was placed in position. To close the coffin, wooden pegs were driven through each hole in the end of the coffin; these pegs were long enough to go through the holes in the transverse bar and so held the lid firmly. The ends of the pegs were cut off flush with the end of the coffin, and were hidden by the stucco and paint of the decoration. To open coffins closed in this way either the pegs must be removed with a centre bit or the lid must be broken up. Tomb robbers adopted the latter method; therefore, as these coffins were found intact, this is undoubtedly an undisturbed burial.

The coffins were made of the *Ficus sycomorus*, the pegs are of acacia, a much harder wood.[1]

NEKHT-ANKH.

The Coffin.

The coffin of Nekht-Ankh (Pl. 1, fig. 6) is of the rectangular shape common in the XIIth dynasty, and the decoration is characteristic of the same period.

(1) I am indebted for the information about the wood of the coffins to Mr. T. G. B. Osborn, Lecturer in Economic Botany in the University, Manchester.

On each side are painted three false doors, and at each end one false door: these are flanked on each side by a vertical line of inscription, dark green hieroglyphs on a yellow ground, or yellow hieroglyphs on a green ground.[1] In the false door on the left side of the coffin near the head, are the two Sacred Eyes. Above the false doors are two horizontal lines of inscription; the upper line has yellow hieroglyphs on a dark green ground, while the hieroglyphs of the lower line are dark green on a yellow ground. The lid has three horizontal lines of inscription, one at each side and one down the middle; the outer lines have yellow hieroglyphs on a green ground, the middle line dark-green hieroglyphs on a yellow ground. The border on the vertical sides of the lid is formed of rectangular squares of colour divided by black and white lines, a characteristic Egyptian pattern. The inside and underside of the coffin are painted pale yellow.

Dimensions: 1·925 × 0·547 × 0·659 m.
For inscriptions, see Pl. 18 and p. 19.

The Body Case.

The case which held the body (Pl. 1, fig. 1) was also of wood, mummiform with a bearded human head wearing a large wig or linen head-dress. The face is painted black, the eyes are black and white surrounded with a bronze rim; the wig is dark-green, probably dark-blue originally; the beard is dark-green with vertical stripes of yellow.

The necklace is represented as being composed of twenty-three rows of beads, alternate rows of cylinder and ring beads strung vertically; the strings are caught at the shoulders into plain terminal pieces, painted green. Round the neck is a band about an eighth of an inch wide representing a string or ribbon on which is threaded a red stone edged with white, having a green bead ringed with black at either end. The colours of the necklace are:

Cylinder beads: Rows 2, 6, 10, 14, 18, 22, dark green on a yellow ground.
„ 4, dark blue, white, dark red.
„ 8, light and dark green.
„ 12 and 20, dark blue, white and red.
„ 16, light and dark green.

Ring beads: black.

The necklace is finished with a row of pear-shaped pendants, light green with a band of blue on a yellow ground.

The lower part of the case is painted to represent the outer bandaging of a mummy over a bead network. The ground is red, the painted beads are dark

(1) For details as to colour, see Inscriptions, pp. 19-30.

green edged with white, at the centre where four meet is a spot of bright green; in the spaces between the beads is a daisy-like flower with white petals, the centre being yellow with a black dot in the middle. The vertical band down the front is dark green with yellow hieroglyphs, the details and outlines of which are in black; the three transverse bands are plain and painted yellow. The bands are continued to the back where they are not joined. The back of the body case is painted red, the inside light yellow.

The case was laid on its left side in the coffin, perhaps with the idea that the eyes of the mummy should see through the eyes of the body case and also through the eyes painted on the outside of the coffin.

Dimensions: Length, 1·610 m.
For inscriptions, see Pl. 20 and p. 23.

The Canopic Chest.

The chest containing the Canopic jars (Pl. 1, fig. 5) is also of wood, painted on each side with a false door surmounted by the Sacred Eyes. Every door is flanked on each side by a vertical line of inscription, and above each door is a horizontal line of inscription. The hieroglyphs are yellow on a green ground. The lid has a border of dark green, and is divided into five panels coloured alternately green and red, each panel is bordered with white and divided from the next by a narrow stripe of green. The middle and two outer panels are inscribed with yellow hieroglyphs.

The interior, which is painted yellow, is equally divided into four compartments, the partitions being about half the height of the outer walls. In these compartments were placed the four Canopic jars, carefully packed and held in place with pieces of linen.

Dimensions: 53 × 52 × 49·2 cm.
For inscriptions, see Pl. 20 and p. 23.

The Canopic Jars (Pl. 21, figs. 1-4).

The Canopic jars are of pottery, painted yellow, with a single vertical line of inscription in black. The heads are of wood; they are all human heads; three are bearded, Hapi alone being beardless. The faces are painted yellow; the hair dark-blue, probably black originally; the beards, eyes and eyebrows black.

All four jars were placed so that they faced the entrance to the tomb.[1]

(1) The Canopic jars are the vessels in which were placed the internal organs of the mummy. These were removed before mummification, and embalmed separately. The jars received their name from the fact mentioned by Herodotus that the Egyptians worshipped the pilot Canopus under the form of a jar with a human head. The earliest Egyptologists imagined that they recognised the figures of Canopus in these jars, and therefore gave them the name of Canopic. The gods who preside over the preservation of the internal organs are the sons of Horus, the gods of the cardinal points. Amset protects the stomach and large intestines; Hapi, the small intestines; Duamutef, the lungs and heart; Qebhsennuf, the liver and gall-bladder.

Dimensions :

Amset and Hapi	...	32 × 17·6 cm. diam.
Duamutef	... ..	31·2 × 17·6 cm. „
Qebḥsennuf	... ...	32 × 17·9 cm. „

For the contents of the jars, see p. 31; for inscriptions, see Pl. 20 and p. 25.

KHNUMU-NEKHT.

The Coffin.

The coffin of Khnumu-Nekht is not so richly decorated as that of Nekht-Ankh. The scheme of decoration is the same, *i.e.* three false doors on each side and one false door at each end; every false door flanked on each side with a vertical line of inscription, yellow hieroglyphs on a dark-green ground. Above the false doors are two horizontal lines of inscription, yellow hieroglyphs on a dark-green ground. The inside and underside of the coffin are painted a creamy white. The lid is painted with three horizontal lines of inscription, one line at each side and one in the middle; the hieroglyphs are yellow on a dark-green ground.

Dimensions : 1·98 × 0·48 × 0·59 m.
For inscriptions, see Pl. 19 and p. 26.

The Body Case.

The body case (Pl. 1, fig. 2) is shaped like a mummy, the face painted yellow; the eyes of limestone and obsidian inserted in a bronze rim; the beard is dark-blue, perhaps black originally, it turns up at the end, and has horizontal indentations to represent plaiting; the head-dress is striped red, blue and green in rotation. Round the neck is painted a black string on which is threaded a barrel-shaped red bead, flanked by two small beads. The necklace consists of twenty-seven rows of beads, alternate rows of ring and cylinder beads, threaded vertically; the strings of beads are caught into a hawk-headed terminal piece on each shoulder; the necklace is finished with a row of pear-shaped pendants.

The colours of the necklace are :

Row 1, black ring beads.
„ 2, blue gray cylinder beads.
„ 3, black ring beads.
„ 4, green cylinder beads.
„ 5, black ring beads.
„ 6, blue gray cylinder beads.
„ 7, black ring beads.
„ 8, red cylinder beads.

This order is repeated to the end. The pendants are alternately two blue and two green.

Except where it is covered with the necklace, the whole of the case, back and front, is painted red with a representation over it of a bead network held in place by a vertical band down the front and three transverse bands going right round the case. The vertical band is dark-green with yellow hieroglyphs; the transverse bands are yellow and are uninscribed.

In front the network is of blue beads edged with white, a spot of black marking the point where four beads meet; the interstices are filled with daisies as on the body-case of Nekht-Ankh; at the back the daisies and the white edges of the beads are omitted.

The inside is painted a creamy white.

The case was laid on its left side inside the coffin.

Dimensions: 1·75 × 1·355 m in circumference.

For inscription, see Pl. 20 and p. 30.

The Statuettes.

See Pl. 21; for inscriptions, see Pl. 17 and pp. 25, 26.

All the statuettes were of wood, painted in conventional colours, dark red for the flesh-tints of the men, yellow for the women. The larger figure of Nekht-Ankh and the figure of Khnumu-Nekht were found inside the coffin of Nekht-Ankh lying on the body case; their exact position could not be ascertained as the coffin had to be moved out of the tomb before being opened. The smaller figure of Nekht-Ankh was found in his brother's coffin, and the exact position of this one was also undiscoverable for the same reason.

The largest statuette is that of Nekht-Ankh and was found in his coffin. It is painted dark red; hair, black; eyeballs, finger-and toe-nails, white. The garment is unpainted and shows the natural grain of the wood. The hands hang at the sides, the backs turned outwards. The head has been whitened on the top as though, perhaps, to represent ashes or some similar substance. The rectangular base on which the figure stands is painted black, with two vertical lines of hieroglyphs in white in front of the feet.

Dimensions: Height, 25·4 cm.
Base, 17·7 × 6·6 cm.

The smallest statuette is that of Nekht-Ankh, and was found in the coffin of Khnumu-Nekht. It is painted brown, the wig black, the garment brown like the

body. The garment is a long kilt which extends from the waist to the knees and is tied in a loop at the waist; the wig falls over each shoulder in front. The figure holds in each hand an indeterminate object painted white; it is rectangular in front of the hand, but at the back it has probably been broken off as there is a small hole in the back of each hand evidently with the purpose of fastening the other part on.

The rectangular base on which the figure stands is painted black, with two vertical lines of hieroglyphs in white in front of the feet.[1]

Dimensions: Height, 15·5 cm.
Base, 9·2 × 4·5 cm.

Statuette of Khnumu-Nekht. This was found in the coffin of Nekht-Ankh. The flesh is painted brown, the eyeballs and finger and toe-nails white, the hair grey, and the garment the same colour as the body. The figure holds in the right hand what appears to be a folded piece of linen; in the left hand it holds a long narrow object with fish-tail ends, slightly curved inwards towards the middle on each side. Both these objects in the hands are painted white. The rectangular base is unpainted with four horizontal lines of hieroglyphs in red in front of the feet.

Dimensions: Height, 18 cm.
Base, 10·4 × 4·2 cm.

Statuettes of Women.

The two figures of girls carrying offerings stood on the floor of the tomb side by side, facing the entrance, one boat was between them and the wall of the tomb, and the other boat behind them.

The larger figure is painted yellow, the hair and eyes black, the garment is the same colour as the flesh. On her head she carries a basket filled with offerings which she steadies with her right hand; in her outstretched left hand is a vase. The basket is painted light brown, the effect of basket-work being given by lines of black paint, the offerings are carved in relief and painted white, the vase is coloured red. Round the upper part of the figure from the left shoulder to the right hip is a piece of linen. The rectangular base on which the figure

(1) In Mr. Mackay's notes taken at the time of the finding of the coffin, are these remarks: "The outer case No. 2 (*i.e* Nekht-Ankh) contained two wooden figures. Case No. 1 (Khnumu-Nekht) contained one figure being the smallest of those found." Mr. Mackay is an accurate observer and recorder, therefore, this statement being written on the spot must be taken as final, though one would naturally expect the statuettes to be put in the coffins of their respective owners.

stands is of wood painted black, with two vertical lines of hieroglyphs in white in front of the feet.

Dimensions : Height, 34·7 cm.
Base, 16·8 × 5·4 cm.

The smaller figure is painted yellow, both flesh and garment, the hair is black. On her head she carries a basket of offerings which she steadies with her right hand ; her left hand, which hangs at her side, holds a white bird by the wings. The basket is painted light brown with black lines, the offerings are carved in relief and painted white. The rectangular base on which the figure stands is black with two vertical lines of hieroglyphs in white in front of the feet.

Dimensions : Height, 28 cm.
Base, 13·8 × 6·5 cm.

The Boats.

Besides the statuettes, two boats were found in the tomb (Pl. 16). (For positions, see plan, Pl. 3.) They are not inscribed in any way, but as the inscribed objects in the tomb, with the exception of Khnumu-Nekht's coffin and statuette, belonged to Nekht-Ankh, the uninscribed objects are attributed to him also. Both boats are of wood painted a dark colour, perhaps black originally, the decks white with red bands, and the cabins yellow. The boats were placed with their prows towards the entrance of the tomb, and the mallet and mooring peg were found with them. The figures of the boatmen are also of wood, painted red, the hair black, the garments white. It is worth noting that in the sailing boat, going south with the wind, the steersman and look-out man are standing up, while in the rowing boat, going north, they sit down wrapped in a white garment as a protection against the cold north wind.

The Sailing Boat. The mast and yards remain, but the sail has completely disappeared, if it were ever there. Of the rigging, a small piece of string was found *in situ* knotted to the side of the boat. Four boatmen haul the sail, four sit at the sides of the cabin, the steersman stands at the stern and the look-out man stands at the prow. The master is seated on a chair in front of the cabin. The great steering oar is elaborately painted ; the shaft has transverse bands of alternate red and white ; the upper part of the blade where it joins the shaft has a design of a lotus with the points of the petals downwards, painted a greyish green with details in black ; across the middle of the blade is a wide band of yellow on which are two Sacred Eyes outlined in black, above each eye is a white circle outlined in black intersected by four lines crossing in the middle ; there are two green lines, one red and one black. The lower part of the blade has a lotus with the petals pointing upwards, painted green, outlined in black ; white with a dash of orange represents the inner petals. The extreme tip of the blade is not painted. On the lower side of the blade, at the intersection of the petals of the upper lotus, is a small hole ; the same occurs in the blade of the steering oar of the rowing boat.

Dimensions : 66·3 × 12·7 cm.

Height to top of mast	44	cm.
Height of mast from deck	38·5	„
Length of yards	39·8	„
Length of steering oar	39	„
Length of look-out man's pole ...	17·2	„

The Rowing Boat. The sails still remain, showing how one was rolled round the mast and lashed with rope and the other was made into a bundle and fastened to the mast. The mast itself is laid horizontally, resting partly on the roof of the cabin and partly on a crutch fixed in the deck for that purpose. There are ten rowers, five on each side, the number of oars, however, is not complete, one having been lost perhaps when the funeral furniture was carried up the cliff for the entombment. The figures of the boatmen are of wood, painted red, the hair black, the garments white ; the look-out man and steersman squat at their posts ; the master wrapped in a long white garment, sits on a chair in front of the cabin. The steering oar is painted in the same design and colours as that of the sailing boat. The rowing oars are pale yellow, with a band of black on the shaft about one-third of the length from the end.

Dimensions : 66 × 14 cm.

Height to top of rudder post	40 cm.
Length of steering oar... ...	40 „

The Pottery.

Two pieces of pottery were found which are also included in the tomb furniture of Nekht-Ankh ; both are uninscribed (Pl. 5, figs. 2, 3).

The jar is of plain red pottery, neither very fine nor very coarse, washed with red paint. The body is a long oval, with a rounded base and a straight wide neck ; inside were some stalks and leaves.[1] It stood in the angle between the Canopic chest and the wall, leaning against the former.

Dimensions : 27·1 × 14 cm. diam.

The dish is a flat circular pan of light red pottery, rather coarse, and was filled with leaves and stalks of the same plant as those in the jar. It stood on the Canopic chest.

Dimensions : 12·5 × 42 cm. diam.

(1) The leaves and stalks have been identified as a species of laurel by Mr. Harold Murray, Assistant Keeper in the Manchester Museum.

4.—THE INSCRIPTIONS

See Pls. 18, 19, 20 which are reproductions of those given in "Gizeh and Rifeh," Pls. xiii. F—H.

Coffin of Nekht-Ankh.

LID.

1. (*Yellow on green*). Ḏd mdw ḥmś-k ḥr psḏ n
Speech: mayst thou sit upon the *pesekh*-seat of

mfk't r ḥ'tï wï' n R' W'b-k m š-kbjj
turquoise at the prow of the boat of Ra; mayst thou be purified in the Cool Lake;

k'p n-k 'Inp śntr im'ḫjj s' ḥ'tï'
may cause to smoke for thee Anubis incense, O worthy one, son of a hatia-prince,

Nḫt-'nḫ[1] ỉr n Ḫnm ''
Nekht-Ankh, born of Khnum-Aa.

2. (*Green on yellow*). Śtn ḥtp dỉ 'Inp nb Sp'
May the King give an offering and Anubis lord of Sepa,

ḫntï sḏ ntr ḏ'-f sm'-f t'
chief of the hall of the god, that he may cross, that he may unite with the earth

'rf n ntr nb pt m ḥtp
[be buried], that he may ascend to the great god, the lord of heaven, in peace

sp-sn[2] ḥr w'wt nfrt nt 'Imnt.
(twice), upon the beautiful roads of the West.

3. (*Yellow on green*). Ḏd mdw pššnś mwt-k Nwnwt ḥr-k
Speech: Hath spread herself thy mother Nunut above thee

m rn-s n št-pt[3] djn-ś wn-k m ntr nn ḫftïw-k
in her name of Shet-pet. She has caused that thou art as a god, without enemies,

(1) Nekht-Ankh = Power of Life. Khnum-Aa = Khnum is great.

(2) *Sp-sn* is an instruction to the reader to repeat the last phrase twice, "In peace, in peace."

(3) Dr. Naville translates this as "Veil of the Sky." The whole of this third line is an interesting variant of the 178th chapter of the Book of the Dead.

m rn-k n ntr ᶜ Ḫnm-ś tw mᶜ iḫt nb dwt m rn-s
in thy name of Great God. She defendeth thee from all things evil in her name

n Ḫnmt[1]
of Khnumt.

SIDE A-B. Horizontal Lines.

1. (*Yellow on green*). Śtn ḥtp dj 'Inpw tp Dw-f
May the king give an offering and Anubis, chief of Du-ef,

imj Wt[2] nb t' ḏsr dj-f ḳrst nfrt m ḫ'swt
he who is in Ut, lord of the Sacred Land,[3] may he give a good burial in the deserts

'Imnt m is-f n Ḫrt-ntr im'ḫ s' ḥ'tï-'
of the West, in his tomb of the underworld, the worthy one, the son of a hatia-prince,

Nḫt-'nḫ mᵛᶜ ḫrw
Nekht-Ankh, true of voice.

2. (*Green on yellow*). Ḏd mdw wn 'wï i'ḫt
Speech: are opened the gates of the horizon,[4]

śnḫbḫb 'ḳ"t-ś iwn - f ḫr t dšrt iwn - f ḫr - t
are withdrawn its bolts. He has come to thee, O Red Crown, he has come to thee,

wrt iwn - f ḫr t wrt ḥḳ'w w'b n ṯ
O Great One, he has come to thee, O Great One of Magic[5]; pure things for thee,

'pd (?) n t ḥtpt ḥr - f ḥtpt ḥr - f w'bw
fowls (?) for thee; are satisfied with it, are satisfied with it, the priests.

Vertical Lines.

1. (*Green on yellow*). Ḏd mdw wbn - k m šwï Śpd
Speech: thou shinest as the two feathers of Sopd.

2. (*Yellow on green*). im'ḫjj ḫr Ḥpjj, Nḫt-'nḫ mᵛᶜ- ḫrw
Worthy before Hapi, Nekht-Ankh, true of voice.

(1) There is a play upon the name of the goddess and the word Khnem "To defend," probably with an allusion to the local god Khnum of Shashotep.

(2) The city of embalming.

(3) The cemetery.

(4) These phrases are also found in the Pyramid Texts.

(5) A title of Isis.

3. (*Yellow on green*). im'ḫjj ḫr Tfnt Nḫt-'nḫ ir n Ḫnm-ʿ
Worthy before Tefnut, Nekht-Ankh, born of Khnum-āa,

m'ʿt - ḫrw
true of voice.

4. (*Green on yellow*). Ḏd mdw ḥ' n - k w
Speech: may come to thee donkeys[1].

5. (*Green on yellow*). Ḏd mdu ir n - k śm ḫt
Speech: may perform for thee the sem-priest ceremonies

m prt
at the Going-forth.[2]

6. (*Yellow on green*). im'ḫjj ḫr Nwnwt mśt ntrw
Worthy before Nunut, she who has borne the gods.

7. (*Yellow on green*). im'ḫjj ḫr Kbḥsnnwf
Worthy before Qebhsennuf.

8. (*Green on yellow*). Ḏd mdw rgst n - k 'pd iḫw tp 450
Speech: are sacrificed for thee birds and oxen, 450 head[3]

nt pr - ḏt (?)
of the domain of eternity.

SIDE C-D. Horizontal Lines.

1. (*Yellow on green*). Śtn ḥtp dj Wsir nb Ddw
May the King give an offering and Osiris lord of Busiris,

ntr nb 'bdw m iswt - f nbt Dj - f pr - ḫrw
the great god, lord of Abydos, in all his places. May he give the funeral offerings

iḫw 'pdw mnḫt śntr mrḥt iḫt nbt nfrt w'bt 'nḫt
of oxen and birds, clothing, incense, ointment, and all things good and pure, on

ntr im n k' n im'ḫjj Nḫt - 'nḫ ir n
which the god lives[4], for the *Ka* of the worthy one, Nekht-Ankh, born of

Ḫnmw ʿ
Khnumu-Aa.

(1) This apparently means that the donkeys are to come laden with offerings.
(2) The Going-forth of the Sem-priest was the name of a festival on which ceremonies were performed for the dead.
(3) This sign is greatly mutilated in the original and should probably be *tp* and not *ḥr*.
(4) Literally: Which lives the god thereon.

2. (*Green on yellow*). Ḏd mdw ḥs tw pśdt ntrw ʿt dw'
Speech: praise thee the great ennead of the gods, worship

tw pśdt ntru šrt ḥs tw ỉtrt šmʿt rn tw
thee the little ennead of the gods, praises thee the *ytert*(1) of the South, names thee

ỉtrt mḥjjt ḥtm tw mtkï m ʿnḫ šmś tw pdt 9
the *ytert* of the North; complete thee thy nerves with life, follow thee the nine

bows.

Vertical Lines (*reading from D to C*).

1. (*Green on yellow*). wśḫ ỉst - k m-ḫnw-n wi'
May be broad thy seat within the boat.

2. (*Yellow on green*). im'ḫjj ḫr 'Imst Nḫt-ʿnḫ m"-ḫrw
Worthy before Amset, Nekht-Ankh true of voice.

3. (*Yellow on green*). im'ḫjj ḫr Šw s' Rʿ nb pt
Worthy before Shu, son of Ra, lord of heaven.

4. (*Green on yellow*). S' m ʿtï h' n - k pt
Protected in [thy] limbs, may approach to thee heaven.

5. (*Green on yellow*). Wnm šns pr m
The eating(2) of a *shens*-cake which comes forth from

Ḥsm.
Letopolis.

6. (*Yellow on green*). im'ḫjj ḫr Gb ỉt ntru Nḫt-ʿnḫ m"
Worthy before Geb, father of the gods, Nekht-Ankh, true

ḫrw
of voice.

7. (*Yellow on green*). im'ḫjj ḫr Dw'mwtf Nḫt-ʿnḫ m"-ḫrw
Worthy before Duamutef, Nekht-Ankh, true of voice.

8. (*Green on yellow*). Ḏd mdw ỉn Rʿ ỉr rn - k m Ḥr
Speech of Ra: I make thy name as Horus.

END A-D. Horizontal Lines.

1. (*Yellow on green*). im'ḫjj ḫr Nbt-ḥt Nḫt-ʿnḫ m"-ḫrw
Worthy before Nephthys, Nekht-Ankh, true of voice.

(1) The *yterts* are the two sides of the Judgment Hall of Osiris. The words here refer to the forty-two assessors who sit along the sides of the Hall and to whom the Negative Confession is addressed.

(2) Perhaps ḥtp dj "The offering."

2. (*Green on yellow*). Ḏd mdw wnḫ - k m w'bw n
Speech: mayst thou be clothed in the pure garments of

Pth Nḫt - 'nḫ
Ptah, Nekht-Ankh.

Vertical Lines.

1. (*Green on yellow*). im'ḫjj ḫr pśdt ntrw ''t Nḫt - 'nḫ
Worthy before the great cycle of the gods, Nekht-Ankh.

2. (*Green on yellow*). im'ḫjj ḫr pśdt ntrw nḏst
Worthy before the little cycle of the gods.

END C-B. Horizontal Lines.

1. (*Yellow on green*). im'ḫjj ḫr 'Iśt ntrt Nḫt - 'nḫ
Worthy before Isis the goddess, Nekht-Ankh.

2. (*Green on yellow*). Ḏd mdw Pr ỉt-k ṗn m pr-k
Speech: may go forth this thy father from thy house.

Hr sḫn-f tw
Horus, may he embrace thee.

Vertical Lines.

1. (*Green on yellow*). im'ḫjj ḫr Nt Nḫt-'nḫ ir n '' Ḫnm
Worthy before Neith, Nekht-Ankh, born of Aa-khnum.

Body Case of Nekht-Ankh (Pl. 20, fig. 9).

(*Yellow on green*). Śtn ḥtp dj Wśjr nb Ddw
May the king give an offering and Osiris lord of Busiris,

ntr '' nb 'bdw dj - f pr - ḫrw ỉḫw 'pdw
the great god, lord of Abydos. May he give funeral-offerings of oxen, and birds,

mnḫt śntr n k' n im'ḫ s' h'tï - ' Nḫt-
clothing and incense, for the *Ka* of the worthy one, son of a hati-a prince Nekht-

'nḫ ir n Ḫnm-''
Ankh, born of Khnum-aa.

Canopic Chest (Pl. 20, figs. 1-3).

(*All inscriptions are in yellow on green*).

1. *LID.* im'ḫjj ḫr 'Inp tp Dw-f imj Wt
Worthy before Anubis, chief of Duef, he who is in Ut.

2. im'ḫjj ḫr 'Inp nb Sp'
Worthy before Anubis, lord of Sepa.

3. im'ḫjj ḫr 'Inp ḫntï sḥ ntr dj - f
Worthy before Anubis, chief of the divine Hall, may he give.

SIDE A-D. Horizontal Line.

im'ḫjj ḫr Ḥpjj Nḫt-'nḫ m^{x} - ḫrw
Worthy before Hapi, Nekht-Ankh, true of voice.

Vertical Lines.

1. im'ḫjj ḫr pśdt ntrw ''t
Worthy before the great cycle of the gods.

2. im'ḫjj ḫr pśdt ntrw nḍst
Worthy before the little cycle of the gods.

D-K. Horizontal Lines.

im'ḫjj ḫr Dw'mwtf
Worthy before Duamutef.

Vertical Lines.

1. im'ḫjj ḫr Šw
Worthy before Shu.

2. im'ḫjj ḫr Nt
Worthy before Neith.

K-H. Horizontal Line.

im'ḫjj ḫr Ḳbḥsnnwf
Worthy before Qebhsennuf.

Vertical Lines.

1. im'ḫjj ḫr Tfnt
Worthy before Tefnut.

2. im'ḫjj ḫr Gb ỉt ntrw
Worthy before Geb, father of the gods.

H-A. Horizontal Line.

im'ḫjj ḫr 'Imśtj Nḫt-'nḫ
Worthy before Amset, Nekht-Ankh.

Vertical Lines.

1. ỉm'ḫjj ḫr Nt
Worthy before Neith.

2. ỉm'ḫjj ḫr Srḳt
Worthy before Serk.

The inscriptions on the canopic jars are the same as on the horizontal lines of the sides of the chest; *i.e.*, "Worthy before Amset. Worthy before Hapi. Worthy before Duamutef. Worthy before Qebhsennuf."

Statuettes (Pl. 17, figs. 1-5).

Large Figure of Nekht-Ankh (fig. 1).

1. ỉm'ḫjj Nḫt-'nh
The Worthy one Nekht-Ankh.

2. ỉr n Ḫnmw-ʿ m" ḫrw nb ỉm'ḫ
born of Khnumu-aa, true of voice, lord of devotion.

Small Figure of Nekht-Ankh (fig. 2).

1. ỉm'ḫjj Nḫt-
The worthy one Nekht-

2. 'nḫ ỉr n Ḫnmw-ʿ m"t-ḫrw
Ankh, born of Khnumu-aa, true of voice.

Figure of Khnumu-Nekht (fig. 5).

1. W'b ʿ n Ḫnm
The great Uab-priest of Khnum,

2. Ḫnmw - Nḫt
Khnumu-Nekht

3. ỉr n Ḫnmw-ʿ
born of Khnumu-aa,

4. m"-ḫrw nb ỉm'ḫ
true of voice, lord of devotion.

Large Figure of Offering Girl (fig. 3).

1. ỉm'ḫjjt 'ḳwt
The worthy one, the provisioner (?),

2. ỉr (?) ỉr n Ḫntn m"-ḫrw
Ar (?) born of Henten, true of voice.

Small Figure of Offering Girl (fig. 4),

1. im'ḫjjt wb't (?) pr (?) 'q't
The worthy one, the servant of the house, provisioner,

2. 'lḳj irt n Ḏdw m"-ḫrw
Aqa, born of Zedu, true of voice.

Coffin of Khnumu-Nekht (Pl. 19).

(*All the inscriptions are yellow on a green ground.*)

LID.

1. Ḏd mdw pssnś mwt-k Nwt ḫr - k m rn-s n
Speech: hath spread herself thy mother Nut above thee in her name of

št-pt Dj-ś wn-k m ntr nn ḫftïw-k m
"Veil of heaven." She has caused that thou art as a god, without enemies, in

rn-k n ntr " nb pt ij n-k ij n-k mwt-k
thy name of Great god, lord of heaven; comes to thee, comes to thee thy mother,

Nwt Wnn-s m
Nut. She is as.

2. Śtn ḥtp dj 'Inpw ḫntï sḥ ntr nb
May the king give an offering and Anubis, chief of the divine Hall, lord of

Sp' dj-f ḏ'-k pt sm'-k t' r
Sepa; may he give that thou traverse heaven, that thou unite with the land at

iśwt w'b imt pt im'ḫ w'b " ś'
the pure places which are in heaven, O worthy one, great uab priest, son of a

ḥ'tï-' ḪInmw-Nḫt ir n Ḫnm- " m"-ḫrw
hatia-prince Khnumu-Nekht, born of Khnumu-aa, true of voice.

3. Ḏd mdw iwt n - k ijw n Ḥr ḥr-ib pr
Speech: May come to thee those who go unto Horus in the midst of the house

Wśjr r ḳrś it-f Wśjr hrw pw n ḥbś ntrw ḏmdw
of Osiris to bury his father Osiris, on that day of clothing the gods; those collected

r ḳrś Wśjr hrw pw n wdt Ḫrt-ntr[1]
to bury Osiris, on that day of landing at Khert-neter.

SIDE B-A. Horizontal Lines.

1. Śtn ḥtp dj Wśjr nb Ddw ntr nb
May the king give an offering and Osiris, lord of Busiris, great god, lord of

(1) The Necropolis; literally: "the underworld of the god."

'bdw m iswt-f nb Dj-f pr-ḫrw iḫw 'pdw mnḫt
Abydos, in all his places. May he give funeral offerings of oxen, birds, clothing,

śntr mrḥt iḫt nb nfr w'b ḳm't pt ḳm't t'
incense, ointment, and all things good and pure, which heaven creates, which the

b'ḥ[1] 'nḫ ntr im n k' n im'ḫ
earth creates in abundance (?), on which the god lives, for the Ka of the worthy one,

w'b " n Ḫnm nb š'śḥtp s' ḥ'tï'
great uab-priest of Khnum lord of Shas-hotep, the son of a hatia-prince

Ḫnmw-nḫt
Khnumu-nekht.

2. Ḏd mdw[2] pr śbh m r n wrw nbw ḫr ḏstjjt m
Speech: issues a shout from the mouth of all the great ones, falls a cry from

r n ḥbśw ḫr ḫrw krj[4] n imiw
the mouth of the enwrapped ones[3] at the voice of thunder of those who are in

i'ḫt m'n-śn nr ḫr-śn njwtiw ṯ'-śn[5]
the horizon, [when] they see terror upon them; there is not their moving.

Vertical Lines.

1. im'ḫjj ḫr 'Imśtj
Worthy before Amset,

2. W'b " n Ḫnmw s' ḥ'tï' Ḫnmw-nḫt
the great uab-priest of Khnumu, the son of a hatia-prince, Khnumu-Nekht,

ir n nb[6] pr Ḫnm "
born of the lady of a house Khnum-aa.

3. im'ḫjj ḫr Šw Wśjr
Worthy before Shu and Osiris,

(1) An absolute substantive used adverbially. See Erman's Grammar, 324.

(2) It seems evident that the inscriptions following the Ḏd mdw formulæ should be read one after the other, though it was more convenient to translate them in the order in which I have given them.

(3) The mummified and bandaged dead?

(4) The determinative is a storm of rain pouring down from the sky.

(5) The sentence from *ḫr-sn* onwards is very obscure.

(6) The feminine ending is omitted.

4. W'b ˁ s' s' ḥt'ı' Ḫnmw-nḫt
the great uab-priest, the son of a son of a hatia-prince, Ḫnumu-Neḫt,

ir n nb pr Ḫnm- ˁ
born of the lady of a house, Ḫnum-aa.

5. im'ḫjj ḫr Tfnt Nwt Wśjr
Worthy before Tefnut, Nut, and Osiris,

6. W'b ˁ n Ḫnmw nb Š'śḥtp Ḫnmw-nḫt
the great uab-priest of Ḫnumu, lord of Shas-hotep, Ḫnumu-Neḫt.

7. W'b ˁ s' s' ḥ'tı' Ḫnmw-nḫt ir
The great uab-priest, son of the son of the hatia-prince, Ḫnumu-nekht, born

n nb pr Ḫnmw- ˁ
of the lady of a house, Ḫnumu-aa.

8. im'ḫlj ḫr Dw'mwtf Wśjr
Worthy before Duamutef and Osiris.

SIDE C-D. Horizontal Lines.

1. Śtn ḥtp dj 'Inpw tp Dw-f nb r
May the King give an offering and Anubis chief of Du-ef, lord of the Mouth

ḳrrt imï Wt nb t' ḏsr Dj - f ḳrś nfr
of the Hole,(1) he who is in Ut, lord of the sacred land, may he give a good burial

m śmjjt (2)imntt mm im'ḫw ḫrt-ntr im'ḫ s'
in the western desert among the worthy ones of Ḫert-neter, O worthy one, son of

s' ḥ'tı' Ḫnmw-nḫt, ir n Ḫnmw- ˁ m''t-ḫrw
the son of a hatia-prince, Ḫnumu-nekht, born of Ḫnumu-aa, true of voice.

2 Ḏd mdw ỉw ḫrw im'ḫjjw ỉjw m ḥtp n imnt nfr
Speech : It is the voice : O worthy ones, come in peace to the beautiful West

m ỉ' Nsrsr ỉj Wśjr Ḫnmw-nḫt pn m ḥtp m ỉ'
from the island of Neserser, comes this Osiris Ḫnumu-nekht in peace from the

Nsrsr Ksw n - f ḫr ḫtw [tn] ir n - f
island of Neserser. Prostrate yourselves to him upon your bellies, make to him

hnnw ḳm'w n - f s' mḏ't ntr
adorations, produce ye for him the protection of the book of the god.

(1) R-krrt is the name of the necropolis of Siut.

(2) The reading of the desert-sign is worth noting.

Vertical Lines.

1. im'ḫjj ḫr Ḥpjj
Worthy before Hapi

2. s' s' ḥ'tï' Ḫnmw-nḫt ir n Ḫnmw- ⁽ⁿ⁾
the son of the son of a hatia-prince Khnumu-Nekht, born of Khnumu-aa.

3. im'ḫjj ḫr Gb
Worthy before Geb,

4. W'b ⁽ⁿ⁾ n Ḫnmw nb Š'śḫtp
the great uab-priest of Khnumu, lord of Shas-hotep.

5. im'ḫjj ḫr Nwt Tfnt Wśjr
Worthy before Nut, Tefnut, and Osiris,

6. s' s' ḥ'tï' Ḫnmw-nḫt ir n Ḫnmw ⁽ⁿ⁾
the son of the son of a hatia-prince Khnumu-Nekht, born of Khnumu-aa.

7. W'b ⁽ⁿ⁾ n Ḫnmw nb Š'śḫtp Ḫnmw-nḫt
The great uab-priest of Khnumu, lord of Shas-hotep, Khnumu-nekht.

8. im'ḫjj ḫr Ḳbḥśnnwf
Worthy before Qebḥsennuf.

END B-C. Horizontal Lines.

1 im'ḫjj ḫr Nbt-ḥt Ḏd mdw : iw ḫrw
Worthy before Nephthys. Speech : It is that the voice

2. ḥ'w m r śt'w ntrw ḫrt-ntr
rejoicing in the mouth of the passages [is that of] the gods of Khertneter.

Vertical Lines.

1. im'ḫjj ḫr pśdt ntrw ⁽ⁿ⁾t
Worthy before the great cycle of gods.

2. im'ḫjj ḫr Nt
Worthy before Neith.

END A-D. Horizontal Lines.

1. im'ḫjj ḫr 'Iśt Ḏd mdw in 'Iśt
Worthy before Isis. Speech by Isis.

2. 'Inḏ ḥr-k śnḏm dj-k ih-f Wśjr
Hail to thee, pleasant one (?); thou causest that he rejoice, [viz.] Osiris.

Vertical Lines.

1. im'ḫjj ḫr pśḏt ntrw nḏst
Worthy before the little cycle of gods.

2. im'ḫjj ḫr Śrḳt
Worthy before Serk.

Body-Case of Khnumu-Nekht (Pl. 20, fig. 8).

Śtn dj ḥtp Ḫnmw R' Wsjr nb Š's.ḥtp
May the King give an offering, and Khnum-Ra-Osiris lord of Shas-hotep.

dj-f pr-ḫrw t' ḥḳt iḫw 'pdw mnḫt śntr mrḥt
May he give funeral offerings of bread, beer, oxen, fowls, clothing, incense, ointment,

ḫt nb nfrt w'bt 'nḫt ntr im n k' n w'b ''
all things good and pure, on which the god lives, for the ka of the great uab-priest,

Ḫnmw-nḫt
Khnumu-Nekht.

5.—THE MUMMIES.

NEKHT-ANKH.

THE body had fallen to pieces in a great measure before unrolling, but the bones were intact and in position. It was impossible to discover the incision in the abdomen through which the internal organs were removed, as the tissues had given way. The cavity of the chest, and probably of the abdomen also, had been stuffed with matting (see Pl. 6, fig. 4), lumps of which, as large as a man's fist, having been thrust upwards under the ribs. The packing was not very solid, and appeared to be chiefly in the chest cavity. The remains were quite moist, and many of the bandages were as wet as though they had been dipped in water, owing to deliquescence of the salt in damp air.

The colour of the remains as well as of the matting was a dark brown. The skin was perfectly preserved on the face, and the hair remained on the head and on the sides of the face. The hair was dark brown, turning grey, and the length of it on the head was three-quarters of an inch.

The nails of the fingers and toes were wrapped with thread to keep them from coming off when the body was lifted out of the preserving bath.

Great numbers of a small brown beetle, *Gibbium scotias*,[1] were found in the inner bandages, especially about the head, and many of the bandages were perforated with their holes. Curiously enough, the outer bandages showed no signs of the beetles, which looks as though they had bred under the folds of the linen.

The Contents of the Canopic Jars.

By Dr. John Cameron.

Amset.—A large dark-brown disc-shaped mass which probably represents a *single* hollow viscus, the walls of which have become approximated. At one part the walls can be separated from one another. The interior is dark-brown, almost

(1) I am indebted to Mr. J. Ray Hardy, Curator of Entomology, in the Manchester Museum, for the identification of this beetle.

black, the external surface is mottled with white. Most probably the stomach. It was wrapped in a piece of linen, held together with a strip of fringe applied crossways.

HAPI.—Organic remains of a dark-brown colour, apparently a hollow viscus, the walls of which have become approximated to one another and fused so as to become a hard brittle mass. This cannot be more than a small piece of the intestines.

DUAMUTEF AND QEBHSENNUF.—Empty.

KHNUMU-NEKHT.

Unlike the mummy of Nekht-Ankh, this mummy was absolutely dry, and the tissues had resolved into a fine powder which rose in clouds when the mummy was handled. The bandages also were absolutely dry and there were no traces of any insects. The difference in the condition of the two mummies was very striking.

The skull had come away from the wrappings before unrolling; only a fragment of skin remained on one side of the head. The skin of the body wherever it remained was white, of the colour and texture of vellum, and was fretted into innumerable little holes, presumably by the action of the preservative. The tendons were dried till they looked like sticks, and the flesh was reduced to a fine light-brown powder.

The arms were laid flat against the sides, each hand resting in the corresponding groin, palmar surface downwards, the edge of the right thumb slightly overlapping the edge of the left thumb. The tip of the right hand was about 1½ inches below the left. On removing the forearms and hands, deep grooves were visible on the front of the abdominal wall.

Though each digit was separately bandaged, no special care had been taken to preserve the nails.

6.—THE ANATOMY OF THE MUMMIES.

By Dr. John Cameron.

THE SKELETON.

THE comparative study of these two skeletons proves to be interesting from two standpoints, namely :—

(1) The remarkable racial difference in the features presented by each. These differences are so pronounced that it is almost impossible to convince oneself that they belong to the same race, far less to the same family.

(2) The appearance presented by the skeleton of Nekht-Ankh is suggestive of its being that of a eunuch.[1] On first inspection of the bones of this skeleton the writer was much struck with their slimness, delicate moulding, and the faintness of the muscular impressions. Indeed, their female character proved to be so pronounced that at first it was difficult to be sure that the skeleton was really that of a male. The first thing to do was thus to decide this point, and, accordingly, the pelvis was re-articulated for the purpose of examining the pelvic brim and the angle formed by the pubic arch. The latter was found to be decidedly less than a right angle, while the outline and dimensions of the pelvic brim (to be given later) also proved to be characteristic of the male. The question of the skeleton being that of a eunuch next suggested itself; but, unfortunately, the state of preservation of the external genitals (see page 44) does not permit one to make a definite pronouncement on this question. If this could have been proved definitely then we should have been provided with a distinctly rare opportunity of comparing the skeletons of two brothers, one of whom was virile, and the other a eunuch. The very peculiar features presented by the skeleton of Nekht-Ankh have, however, warranted the writer in applying the term *eunuchoid* to it ; whilst the other will be referred to throughout as that of the priest (Khnumu-Nekht).

The Approximate Age.

The sagittal and coronal sutures are obliterated on the interior of the eunuchoid skull, which represents an age of at least sixty. The sutures of

(1) A further discussion of this question will be found in the section dealing with the generative organs.

the priest's skull do not exhibit any evidence of synostosis, so that he must have been at or below middle life.

The Stature.

This was first of all estimated from the length of the femur, taking this as 0·275 of the stature, a factor which is given by Prof. Thane.[1] Calculated in this manner the stature of the alleged eunuch proved to be 5 feet 3½ inches, and this turned out to be his actual height when the skeleton was rearticulated. With the above factor the priest's stature worked out at 5 feet 2⅓ inches, and his measured height 5 feet 3 inches. Owing to the very short stature the bones of the two brothers are much smaller than average modern European bones.

The Skulls.

On comparing the two skulls certain striking differences may be made out (Fig. 1). On side view the eunuchoid skull is well vaulted, whilst the other exhibits a peculiar flattening. Gall[2] describes a peculiar loss of convexity in that portion of the occipital bone between the foramen magnum and external occipital protuberance in eunuch crania, associated with imperfect development of the cerebellum, which he regards as a characteristic of such skulls. This statement has been challenged by Rieger,[3] but supported by Möbius.[4] The skulls of Nekht-Ankh and Khnumu-Nekht, it may be mentioned, show no marked difference in the configuration of this region. Other striking features of contrast in the same Fig. are the markedly prognathous or negroid type of the virile skull and the equally marked orthognathous character of that of the brother. The slender nature of the zygomatic arches, the feeble degree of development of the temporal ridges, and the want of prominence of the mastoid processes in the latter skull serve as approximations to the female type.

A difference of configuration of the skulls as seen from the back may also be detected (Fig. 2). The norma occipitalis of the virile skull presents slight evidence of the pentagonal outline, which is again suggestive of the negroid type (Fig. 2).

The face view also displays certain peculiarities which further emphasise the female type of the eunuchoid skull. Before giving expression to these it is advisable in the first place to quote what Humphrys[5] says with reference to the female skull.

(1) Quain's Anatomy, ed. 10, vol. 2, part 1.
(2) Anatomie et Physiologie du Système Nerveux, vol. 3, Paris, 1818.
(3) Die Castration, Jena, 1900.
(4) Die Wirkungen der Castration, Halle, 1903. The writer wishes to express his indebtedness to Professor G. D. Thane for the loan of this memoir.
(5) The Human Skeleton.

On p. 232 he states: "the female skull is smaller, thinner, and lighter than that of the male . . . . the bones of the face are small in proportion to those of the cranium: the alveolar processes of the jaws are smaller and more elliptical, and the teeth are smaller and set more vertical; the frontal sinuses are less developed, the superciliary ridges are less prominent, and the facial angle is rather wider." It will be found that every one of these differences can be applied to the two skulls under consideration. Further striking comparisons are furnished by the greater bizygomatic breadth and the more massive jaws of the virile skull, whilst its low receding frontal region and the peculiar position of the orbits confer on it a distinct racial character of its own (Fig. 3). It is, however, much broader than the skull of a pure negro. The feeble development of the superciliary ridges in the eunuchoid skull causes the orbital margin to be peculiarly sharp, and it is rather interesting to notice it stated by Thomson[1] that in the female skull "the superciliary ridges are less pronounced, and this imparts a thinness and sharpness to the upper orbital margin which is fairly characteristic, and can best be appreciated by running the finger along that edge of bone."

On examining the two statuettes of the brothers that are without wigs (Pl. 21, figs. 7, 8), it was immediately recognised that the outline of the head of that labelled *Khnumu Nekht* bore a close resemblance to the well-shaped orthognathous skull of Nekht-Ankh. On the other hand, the head of Nekht-Ankh (the tall statuette) almost exactly corresponded to the skull of Khnumu-Nekht, both on face and side view. Further, the mouth of this statuette is larger, and the lower lip, if anything, rather thicker and more negroid than that of the other. The writer discussed this obvious anomaly with Mr. E. Mackay, who discovered the tomb, and we came to the conclusion that those who had had charge of the burial arrangements must have made a mistake—labelling the statuette of Nekht-Ankh *Khnumu-Nekht*, and *vice versa*. The statuettes are certainly beautifully made, and we think that some credit ought to be accorded to the modeller for having recognised the very distinctive characters presented by the heads of the brothers. The most obvious explanation which offers itself is, that the hieroglyphs were painted on the statuettes by another individual, and he had labelled them wrongly. In support of this suggestion Mr. Mackay points out that the inscriptions must have been put on in a hurry, for they are very badly executed in comparison with those on the coffins and mummy cases.

The Cranial Capacity.

The capacity of the cranium of the priest was found to be 1,505 c.cm. This is decidedly above the European average of 1,480 c.cm Seeing that the skull of Nekht-Ankh exhibits such marked female characters, it is not surprising to find that its capacity—namely, 1,465 c.cm.—is decidedly less than that of his

(1) Cunningham's Anatomy, ed. 1, p. 172.

brother. The capacity of both skulls exceeds 1,450 c.cm. They are thus to be classed as megacephalic.

The Horizontal Cranial Circumference.

The horizontal cranial circumference measured over the glabella, according to Turner's plan, is 52·6 cm. for the priest, and 52·35 cm. in the case of the eunuchoid skull. The former is slightly greater and the latter a little less than the average measurement of the adult European male, which is 52·5 cm.

The Cranial Indices.

It is of interest to find that in the case of the eunuchoid skull the cranial indices compare favourably with those of the modern European.

The *cephalic index* for the priest is 79·45 ; that of the eunuchoid skull is 79·44. Both are thus slightly more brachycephalic than the average English index, which is 76.[1]

The *index of cranial height* in the case of the priest is 70·95, and for the eunuchoid skull 70. This is approximately the same as the average English index of 71.

The important *alveolar* or *gnathic index* is 104·34 in the priest's skull, which is thus extremely prognathous. This actually exceeds in degree the average of the native Australian of to-day, which is 104. The alveolar index for the eunuchoid skull is, on the other hand, only 93·8, the English average being 96, so that it is remarkably orthognathous. Humphry[2] states that in the female "the facial angle is rather wider." The angle he refers to is that devised by Camper, and this means that the female skull is more orthognathous than that of the male. It is thus possible that the effect of castration may be to cause the alveolar index to conform more to the female type (Fig. 1).

The skull of the priest may suggest a reversion to an earlier ancestral type ; but such an extreme difference between the alveolar indices of the two skulls has led the writer to discredit the view that Khnumu-Nekht and Nekht-Ankh were of the same race. One is led to understand from the inscriptions that they are brothers, but it is impossible to believe that they could have been full brothers. They were certainly sons of the same mother, as the hieroglyphs on both coffins clearly indicate. Her name is given as Khnum-aa, and her title is Nebt Per, *Lady of a House—i.e.*, heiress of landed property. The father's name, strangely enough, is not given on either coffin ; but his title *hatia-prince* occurs constantly on both,

(1) The majority of the indices for comparison are taken from Quain's "Anatomy," ed. 10, vol. 2, pt. 1, and Duckworth's "Morphology and Anthropology," 1904.

(2) *Op. cit.*, p. 232.

the phrase on the coffin of the eunuchoid brother running as follows[1]:—*The son of a hatia-prince. Nekht-Ankh, born of Khnum-aa.* The inscriptions on the priest's coffin are slightly different—*The great uab-priest of Khnum. The son of a hatia-prince, Khnumu-Nekht, born of the Lady of a House, Khnum-aa.* Twice over, however, Khnumu-Nekht is called *Son of the son of a hatia-prince*, thus indicating that both his father and paternal grandfather were hatia-princes. It is possible that no significance can be attached to the fact of there being no mention of the grandpaternal ancestry of Nekht-Ankh; but, on the other hand, the condition of Khnumu-Nekht's skull, taken in conjunction with the slight difference in the reading of the two inscriptions, might be suggestive of a different male parent. It is thus possible that Khnum-aa had had two husbands, more particularly in view of the fact that descent was always counted in the female line in ancient Egypt, since the women inherited to the exclusion of the men. One is certainly tempted to believe that the father of Khnumu-Nekht had possessed a negro ancestry, and in this relationship it is interesting to note that Elliot Smith[2] refers to the frequent occurrence of negro admixture in the bones from some Nubian cemeteries (in cemetery No. 7, for example).

The *facial index* of the priest is 55·63, which is very near the English average of 54. The index of the eunuchoid brother is, however, only 50·78, which is unusually low.

The *nasal index* of the priest's skull is 46·95, which practically corresponds to the English average of 46. It is thus leptorhine. The nasal index is credited with a considerable degree of importance by some anthropologists, the lower the index the better being the type of skull. It is thus significant to find that this index is only 44·76 for the eunuchoid skull. It is, however, a peculiar fact that the nasal index is particularly low in the Eskimo skull, where the average is only 44. The latter appears to be highest amongst aboriginal Australians, where it is as much as 57.

The unimportant *orbital index* is found to vary greatly throughout various races, from 91 in the Andaman islander to 80 in the Guanches of Teneriffe. The skulls of the two brothers exhibit almost the extreme limits of these variations, for the index in the case of the priest is as low as 82·92 (microseme), and as high as 92·68 in the other (megaseme). The orbits of the two skulls certainly show a great difference in their shape.

The *stephano-zygomatic index* in the eunuchoid skull, represented by 93·18, is well above the European average of 90·7, whilst that of the priest, namely, 87·21,

(1) A full translation of the inscriptions by Miss Murray will be found on p. 19
(2) *Bull. Archæol. Survey Nubia*, No. 1.

is decidedly lower, as would be expected in this type of skull. This index may sink so low as 73·7, which was found to be the average amongst Fiji islanders.

CRANIAL MEASUREMENTS.

	Khnumu-Nekht.	Nekht-Ankh.
Cranial length	18·225 cm.	18 cm.
Cranial breadth	14·5 cm.	14·3 cm.
Basal height of cranium	12·95 cm.	12·6 cm.
Horizontal circumference ...	52·6 cm.	52·35 cm.
Nasion to basion	10·35 cm.	9·8 cm.
Basion to alveolar point	10·8 cm.	9·2 cm.
Nasal height	5·75 cm.	5·25 cm.
Nasal breadth	2·7 cm.	2·35 cm.
Bizygomatic breadth	13·3 cm.	12·8 cm.
Nasion to alveolar point	7·4 cm.	6·5 cm.
Interstephanic breadth	11·6 cm.	11·8 cm.
Orbital height	3·4 cm.	3·8 cm.
Orbital breadth	4·1 cm.	4·1 cm.

THE TEETH.

The teeth of both are excessively worn from chewing the hard particles in their food, the grinding surfaces of the molars being quite cup shaped, with a thin edging of enamel. One of the molars of the eunuchoid brother is slightly decayed, and all his teeth are present with the exception of the right lateral incisor of the upper jaw, which had been removed during life (Pl. 15, fig. 18). This fact, together with its possible significance, will be referred to again in the description of the generative organs.

In the priest's skull the two left incisor teeth of the upper jaw are fused together to form a huge tusk, which must have endowed him with a somewhat forbidding aspect (Pl. 11, fig. 4). Behind this extraordinary structure lies an accessory incisor. This fusion of the teeth, or gemination, as it is termed, is rather rare. Smale and Colyer[1] illustrate an example of it in fig. 48, which represents the gemination of two maxillary incisors.

THE VERTEBRAL COLUMN AND LIMBS.

In studying the limb bones a modern "control" bone[2] has been utilised for comparison, and in the photographs is placed between those of the brothers. Note in the first place how small the mummy bones are, compared with the control bone,

(1) "Diseases and Injuries of the Teeth," ed. 2, London, 1901.

(2) I wish here to express my indebtedness to Professor Young for the use of the bones of a disarticulated skeleton in the Anatomy Department, University of Manchester.

which is of average size. This is, of course, in accordance with their very short stature.

The Clavicles

The clavicles of the two brothers present marked differences. Those of the eunuchoid brother are 1·1 cm. longer, the measurements for the right clavicles being 15·35 and 14·25 cm. This increased length applies to all the limb bones of Nekht-Ankh, and is interesting in view of the fact that the effect of castration is to delay the completion of ossification of the long bones, so that they tend to elongate to an abnormal extent. The main characteristic of the eunuchoid clavicle is, however, its extraordinary slenderness, combined with a remarkable smoothness, diminution of the curvatures, and almost entire absence of muscular and ligamentous impressions (Pl. 11, fig. 5). The conoid tubercle, which is prominent in the priest's clavicle, is quite absent in the eunuchoid, whilst the trapezoid ridge is only faintly marked in the latter. The contrast is all the more remarkable when it is pointed out that the eunuchoid brother was a much more active person than the priest, as shown by the excessive development of the well-known squatting facets on the femora, tibiæ and astragali of the latter.

The Scapulæ.

The scapulæ form an interesting contrast. Those of the eunuchoid brother are extraordinarily narrow towards the inferior angle (Pl. 12, fig. 6), the vertebral borders are almost straight, whilst the muscular markings are of the faintest. The length measured from the highest point of the superior border to the inferior angle is 14·95 cm., and the greatest breadth 10·65 cm. The corresponding measurements for the priest's scapulæ are 15·25 and 10·55 cm. The scapular index for the eunuchoid brother is 71·23, and for the priest 69·18. The average English index is decidedly lower—namely, 65—whilst in the African pigmy it is found as high as 87·9.

The Humeri.

The humeri of the eunuchoid brother are 1·55 cm. longer than those of the priest. The measurements are 31·65 and 30·1 cm. Those of the eunuchoid man are slim and straight compared with the well marked curvatures of the average male humerus (Pl. 12, fig. 7), whilst the muscular impressions are very faint indeed.

The Radii.

The radii of the eunuchoid brother are also remarkably straight and rod like (Pl. 12, fig. 8). They are 0·4 cm. longer than the priest's, the measurements being 24·9 and 24·5 cm. The loss of curvature is very decided when compared with those of the priest. The radio-humeral index for the eunuchoid brother is 78·67 and for the other 81·39. Both are distinctly higher than the average European index which is usually below 75, whilst that of the priest is above the negro average of 79.

The Ulnæ.

The ulnæ of the eunuchoid brother are 0·45 cm. longer than those of the priest. The measurements being 26·85 and 26·4 cm., but they are slimmer and smoother, and present altogether an extraordinary appearance.

The Vertebræ.

The edges of the bodies in both brothers possess small bony exostoses which appear to be associated with osteoarthritis. The vertebræ of the priest remained attached to one another by the remains of the discs and ligaments. Those of the eunuchoid brother were quite separate, and the measurements of his lumbar vertebræ proved interesting. In the first and second (see subjoined table) the vertical measurements of the posterior surface are greater than those of the anterior; the two are practically the same in the third, whilst in the fourth and fifth those of the anterior surface predominate, as the following table shows—

Vertical measurements of the lumbar bodies.

	Anterior.	Posterior
1st	2·525	2·8
2nd	2·6	2·7
3rd	2·525	2·5
4th	2·6	2·35
5th	2·6	2·1

It will be observed from the table that the anterior dimensions vary very slightly; whilst the posterior rapidly diminish from above downwards.

The index of the lumbar region is 96·88.

The Sacra.

The sacrum of the eunuchoid brother tends to exhibit female characters, compared with the European standard at any rate, for its index proves to be 114·6. This is rather more than midway between the average indices for the European male and female, which are 112 and 116 respectively.

The coccyx is fused to the sacrum, due no doubt to the persistent squatting. There are five pairs of anterior sacral foramina, and at first sight the sacrum appears to consist of six pieces. In such cases according to Bacarisse[1] if the lowest limits of the auricular surfaces do not extend below the level of the middle of the third piece of the sacrum, then there are only five pieces, as in the present instances.

The Pelves.

The pelves, as is to be expected in such little men, are decidedly smaller than those of modern European males. The maximum distance between the iliac crests

(1) "Le sacrum suivant le sexe et suivant les races;" thèse, Paris, 1873, quoted on p. 127 of Piersol's Anatomy.

is 26 cm. in the priest and 24·5 cm. for the eunuchoid brother, as compared with 28·2 cm. in the average English male. The antero-posterior diameters at the brim are respectively 9·9 and 9·8, as against 10·1 cm., while the transverse diameters are 11·2 and 11 as against 12·7 cm. The index of the pelvic brim is 88·39 for the priest and 89 for the eunuchoid brother, which is fairly high compared with the European male average of 80. The capacity of both pelves is decidedly less than that of the European male pelvis. It appears from the researches of Becker[1] that the eunuch pelvis manifests no tendency to exhibit female characters.

The Ilia.

The innominate bones of the two brothers are very tiny in comparison with the modern European control bone (Pl. 13, fig. 9). The posterior halves of the ilia in this fig. show a distinct difference in configuration. That of the priest (on the left) is shaped like the control bone, whilst the eunuchoid bone is much narrower, measured across between the great sciatic notch and the iliac crest. The different appearance presented by these two ilia is of great interest, in view of the fact that Dr. Douglas E. Derry[2] recently directed the attention of the Anatomical Society to certain sexual characters that are exhibited by the posterior portions of the iliac bones.

The Femora.

Those of the eunuchoid man are only slightly longer than the priest's, the measurements being 44·45 and 43·75 cm. The great feature of the femora is the extreme degree of development of the squatting facet on the anterior aspect of the necks (Pl. 13, fig. 10), this being particularly marked in those of the priest. Judging from the smaller size of the facets on the femora of the eunuchoid brother, one would be led to infer that he cultivated, comparatively speaking, more active habits, and this fact comes into striking contrast with the smoothness of his bones, compared with the well-marked, muscular and ligamentous impressions of the lazy priest. All four bones exhibit the increased curvature which is associated with the squatting posture (Pl. 13, fig. 11). If faintness of the muscular impressions be a special feature of the bones of the female type of skeleton, then it is interesting in this relationship to compare the degree of development of the great trochanter in the femora of the two brothers. In the eunuchoid femur this bony eminence will be observed to be much less prominent and also decidedly smoother than in the corresponding bone of the priest (Pl. 13, fig. 10).

The humero-femoral index for the priest is 68·8, and for the eunuchoid brother 71·2, results which are very near the English average of 71.

(1) "Der männliche Castrat, mit besonderer Berücksichtigung seines Knockensystems :" Diss.-inaug., Freiburg-i.-B., 1898.

(2) Summer Meeting, June, 1908.

The Tibiæ.

Here again those of the eunuchoid man are slightly longer than the priest's, the respective measurements being 36·8 cm. and 36·5 cm. This slight difference is rather against Nekht-Ankh's being a eunuch, since one effect of castration, as a rule, is to produce a marked elongation of the bones of the leg. Pelikan[1] gives the average length of the leg in eunuchs as 47·6 cm., compared with 43·1 cm. in the male and 42·2 in the female.

The effects of the squatting are most marked also on the tibiæ, as evidenced by a retroversion of the heads (Pl. 14, fig. 12). Indeed this has proceeded to such an extent in those of the priest that the fibular surfaces look almost vertically downwards. This condition forms a striking contrast with the head of the control tibia in fig. 12. Another interesting effect of squatting is to produce an increase in the convexity of the external condylar surface, particularly in its posterior part, as pointed out by Thomson.[2] The facet produced in such cases on the anterior margin of the lower end of the tibia is also present, and is, as with the others, best marked in the priest, who also possesses a corresponding area on the necks of his astragali. The latter is, apparently, only produced in extreme cases of squatting, as the astragali of the eunuchoid brother do not exhibit it at all.

The tibiæ of both brothers exhibit an extraordinary degree of platycnemia (Fig. 13). The tibiæ of the eunuchoid man at the level of the nutrient foramen possess an antero-posterior diameter of 3·2 cm., and a transverse of only 1·8 cm., the index of platycnemia being thus 56·25. The tibiæ of the priest at the same level possess an antero-posterior diameter of 3·3 cm., and a transverse of 1·9 cm., the index of platycnemia being 57·57. It will be noticed that the degree of platycnemia is almost the same in both brothers, and, further, it is particularly low in comparison with that of the average modern European, which is 88·2. The most extreme degree of platycnemia recorded is apparently that of the tibia from the cave of Cro-magnon, which the writer calculates at 36·84 from the outline of this bone figured by Busk.[3]

The tibio-femoral index in the priest is 83·42, and in the eunuchoid brother 82·75. The European average is below 83, as a rule.

The left foot of the priest exhibits a well-marked degree of club foot (*talipes varus*), the thickening of the skin and superficial tissues over the region of the

(1) Quoted by Möbius (*vide supra*). See also von Neugebauer, "Hermaphroditismus beim Menschen," Leipzig, 1908. For the loan of this memoir the writer wishes to express here his indebtedness to Professor Arthur Robinson.

(2) "The Influence of Posture on the Form of the Articular Surfaces of the Tibia and Astragalus." *Journ. Anat. and Physiol.*, vol. 23.

(3) W. Boyd Dawkins, "On the Discovery of Platycnemic Men in Denbighshire;" With Notes on the Human Remains, by Professor Busk, *Journ. Ethn. Soc. London*, Jan., 1871. Fig. 18, p. 458.

cuboid being still quite evident (Pl. 14, fig. 14). Associated with this is well-marked scoliosis, the convexity in the lumbar region being directed, as would be expected, to the left (Pl. 15, fig. 15). This spine also shows well-marked kyphosis, due, no doubt, to the persistent squatting (Fig. 16). The presence of the above malformation would readily explain the degree of squatting that Khnumu-Nekht indulged in; but it is somewhat difficult to understand why a deformed creature, with such a forbidding facial aspect, should have been ordained for the priesthood.

THE VISCERA.

The soft parts of the priest had for the most part become reduced to a dark brown powder, in which the bones were found lying free. This was almost exactly like snuff in appearance, and so fine that it rose in clouds during the removal of the last bandages, and remained suspended in the air for some considerable time. Those portions of the limbs upon which the skin was still preserved were simply bags of powder. The soft parts of the eunuchoid brother presented quite a different appearance. They seemed to contain a deliquescent substance; for they adhered to the bones in the form of moist, cakey lumps (see analysis on page 49).

The contents of the Canopic jars belonging to the eunuchoid brother were examined by the writer, and have been described above (page 31). Strangely enough, there was no set of jars to be found in the tomb for the priest.

The Brain.

The skull of Khnumu-Nekht lay completely detached when the mummy case was first opened, and on recent examination was found to be devoid of contents. The brain of Nekht-Ankh is represented by several masses of a light brown colour, readily reducible by pressure between the fingers to a coarse powder, the total weight of which amounts to 1·88 ounces.

The Larynx.

The thyroid cartilage of Nekht-Ankh—as also remnants of the adjoining laryngeal cartilages, were found well preserved, owing to their having become extensively ossified. There was no trace of the larynx of Khnumu-Nekht, which was to be expected, seeing that he died a much younger man (see page 33).

The Aortic Arch.

Lying in the thorax of Nekht-Ankh, close to the root of the neck, was found a short, curved structure, very much shrivelled up, which, apparently, at one time had possessed a lumen. This probably represents the aortic arch; for at one end is a piece of dried membrane, which is, perhaps, pericardium, whilst a few shreds attached to the convexity may be the remnants of the great vessels. The discovery

of this specimen proves of interest, for it suggests that during evisceration the heart had been removed, leaving the aortic arch *in situ*, exactly after the fashion in *post mortem* examinations now-a-days.

The External Genitals.

The state of preservation of the external genitals in both brothers is most remarkable, more particularly in comparison with the condition of extreme decay in which we find the remaining soft parts. On consulting several eminent Egyptologists with reference to this question, the writer was informed that in the process of embalming special means appeared to be taken to preserve the generative organs. This point is worthy of more than a mere passing reference, for it creates interesting speculations with regard to the significance of the hieroglyph for the word "life"—the *ankh* symbol. This is represented by the loin cloth, and its importance in Ancient Egypt may be judged from its frequent occurrence in inscriptions, and also from the fact that many of the gods and goddesses are constantly represented grasping the symbol in one or other hand, whilst in the elaborate sculptures of King Akhenaten worshipping the solar disc, the rays are represented in the form of long arms, one of which is holding the *ankh* symbol before the king's face, the idea presumably being that the life-giving rays of the sun are endowing him with the power of existence. The writer has frequently wondered whether it were possible that the ancient Egyptians attached a wider and fuller significance to the word "life," and interpreted it as referring to the preservation of the species by reproduction. We know now-a-days that reproduction ensures the immortality of the sexual cell, which is handed down to form the next generation, and is therefore never supposed to die—thus maintaining the continuity both of the germ plasm and of the species. The ancient Egyptians did not, of course, know of the existence of the sexual cell, but they certainly were acquainted with the fact that the genital organs were associated with reproduction. They recognised that castration[1] rendered a person sterile, whilst the frequent occurrence of the phallic symbol in hieroglyphs, and its bearing on the worship of regeneration, add further emphasis to this assertion. It may be wondered, then, if the loin cloth were chosen to represent the *ankh* symbol, because it protected the genital organs, and at the same time *guarded the secret of life*.

The mummified penis of Nekht-Ankh, the bones of whose skeleton have been described as eunuchoid in the foregoing chapter, presents an extraordinary appearance (Pl. 15. fig. 17). It was found lying loose between the thighs after the

(1) See the historical chapter in "Die Wirkungen der Castration," by Möbius, Halle, 1903.

mummy had been unwrapped. It looks like a triangular piece of hard, dried skin, dark brown in colour, from the apex of which there extends a peculiar open channelled structure, also quite firm, and guarded on each side by a well-marked flap. The deep surface of the triangular portion is distinctly marked by the impression of the pubic symphysis, and when fitted on to the latter it is found that the base of the triangle coincides with a transverse line just below the lower margin of the symphysis, whilst the channelled structure projects upwards from the upper margin of the symphysis, and is so inclined as to lie against what would have been the position of the anterior abdominal wall. With the external genitals *in situ* as above, it was at once recognised that the triangular piece represented part of the skin of the perineum, whilst the channelled structure appeared to be the remains of the penis, and suggested the fact that the canal of the urethra had been open on its ventral aspect. There seemed to be no signs of the presence of a scrotum, or testes, thus *apparently* confirming the impression gathered from the eunuchoid character of the skeleton. The writer showed the specimen to Dr. Elliott Smith, and he came to the conclusion that the two lateral flaps on the ventral aspect of the penis probably represented the scrotum. At the same time he remarked that the external genitals of mummies often exhibit most fantastic shapes, a contingency which frequently prevents one from coming to any definite conclusion with regard to the condition of these organs during life. One has obviously to be on one's guard with reference to the building up of any hypotheses founded on an examination of such mummified material.

When the writer first noticed the channelled appearance of the penis, two things suggested themselves—namely, that this had either been a case of congenital hypospadias, or else the operation of subincision (the *mika* operation), as practised to-day by the aboriginal Australians, had been performed. With reference to congenital hypospadias, the writer finds a statement[1] that "the penis is usually only rudimentary, is curved downward, and fixed, so that at first sight it is difficult to determine the sex of the individual." Now, in this case the penis, from the size which it possesses in the mummified condition, must have been of normal size. Further, it is perfectly straight, and does not exhibit any downward curvature or fixation. These facts are decidedly against Nekht-Ankh's having been the subject of congenital hypospadias. On the other hand, the two lateral flaps are so distinct one from another that they may represent the two halves of a congenitally split scrotum into which the testes had or had not descended.

With regard to the question of subincision, an examination of the penis *appeared* to offer still further evidence in support of this. Thus the two lateral flaps extend forwards, so as to involve the glans. The latter shows no clear evidence of the presence of a urethral orifice, though that on the glans penis of the priest is quite distinct. To decide whether the penis was really tunnelled by the urethra, the

(1) Tillmann's "Surgery," vol. 3, p. 338.

writer attempted to make a transverse section, but the interior was found to be simply a mass of fine powder. The prepuce of the eunuchoid brother can be distinguished only on the dorsal aspect, whilst there are no distinct traces of a frœnulum. Both these structures, it may be mentioned, are readily recognisable on the penis of the priest. Further, the tissue lining the channel looks more rugose than that external to the folds; whilst the hair, which can still be recognised on the skin of the perineum, suddenly ceases on the edges of the folds. This is significant. Altogether the evidence appeared to give support to the theory of subincision. Unfortunately, no trace of the urethral orifice can be found. If it had really opened on the perineum, then the aperture must have been further back than the area which has been preserved.

The writer has studied the literature bearing upon the *mika* operation, and read more particularly the investigations made by Spencer and Gillen,[1] Roth,[2] and[3] Bates regarding the customs of the aboriginal Australians. According to these observers, very elaborate arrangements are made for carrying out the operation, and it appears that after subincision in the male and introincision in the female the ceremony is completed by removing an upper incisor tooth. The above observers could elicit no definite explanation as to the association of the extraction of the tooth with the *mika* operation, though the one which naturally suggests itself is, that the absence of the tooth would indicate to strangers that the individual had gone through the ceremonial.

After reading these facts, the writer made an examination of the skull of Nekht-Ankh, and was startled to find that the right lateral incisor of the upper jaw had been removed in some way during life. There can be no doubt of this, for the alveolus, with the exception of a small part of the posterior wall, is entirely absorbed (Pl. 15, fig. 18). It is certainly a very strange coincidence that a penis mummified so as to suggest, amongst other things, the mika operation, should be found associated with absence of one of the incisor teeth. The writer spoke to Professor Flinders Petrie about this discovery, and he suggested the writing of an inquiry to Dr. Capart, of the Musées Royaux, Brussels, on the subject. In his reply that gentleman mentioned that he knew of no reference to the existence of the above operation in ancient Egypt, but he was able to relate an extraordinary occurrence, which will be told in his own words:—"Votre lettre me rappelle un petit fait curieux sur lequel j'attire votre attention. En 1900-1 j'ai assisté à des fouilles faites dans la nécropole thebaine par Newberry. Un jour dans une crevasse de rocher près d'une tombe Newberry decouvrit deux vases à provisions encore bouchés et scellés de la XVIII[e] dynastie, si j'ai bien souvenir. Près des vases etaient placées une petite figurine, et une boite qui contenait seulement *une dent*. C'était donc une espèce de sepulture faite pour une dent. En ecrivant à Newberry

(1) "The Native Tribes of Central Australia." London, 1899.
(2) "Ethnological Studies among the N. W. C. Queensland Aborigines." Brisbane, 1897.
(3) *Glasgow Medical Journal*, Nov. 1907.

à Liverpool vous pourriez peut-être avoir des détails plus précis." The author accordingly interviewed Professor Newberry, who very kindly furnished full particulars of the incident. In answer to a special inquiry as to whether the tooth was an incisor, he could not remember at the time; but, with the view of deciding this point, has kindly arranged to re-examine the specimen at the end of this year in the Cairo Museum, where it is at present lodged.

The writer will rest content with the recording of the above extraordinary facts, for they may serve as an incentive to other observers to be on the outlook for more convincing proof as to the possible existence of this strange operation in ancient Egypt. No reference to it can be found so far, either in the writings or the mural decorations; though, interestingly enough, elaborate representations of the operation of circumcision are to be found in the necropolis of Sakkara.[1] There can be no doubt that the operation is a very ancient and time-honoured one amongst the Australian aborigines, as the four observers referred to above made careful investigations amongst the natives in order to ascertain its origin and significance, and were informed that no one knew what it signified; it had been handed down from time immemorial by their forefathers. In this relationship it is interesting to record that William Dampier[2] in 1699 noticed that the natives of New Holland "wanted two of their fore teeth."

If the lateral flaps of the penis of Nekht-Ankh do represent the result of sub-incision, they would signify that a very extensive operation had been performed; much more so than is practised now-a-days in Australia. The usual result is apparently a slight slitting up, not extending much beyond the glans, though in fig. 429 Roth[3] represents a penis that has been slit back to the scrotum.

(1) See "Egyptological Researches," by W. Max Müller, Washington, 1906; also Capart's "Rue de Tombeaux."

(2) A Voyage to New Holland, &c., in the Year 1699, by Captain William Dampier, 1709. Quoted by W. Clark Russell in his book on Dampier, London, 1889.

(3) *Op. cit.*

7. THE CHEMISTRY OF THE REMAINS.

THE INORGANIC CONSTITUENTS.

By PAUL HAAS, D.Sc., PH.D.

SUBJOINED is an analysis of the inorganic constituents of the sample of Khnumu-Nekht's mummy together with the mean numbers obtained for dried muscle by Prof. Bunge.[1]

	Sample of Mummy, No. 2.	Dried Muscle.
K_2O	1·21	1·75
Na_2O	·24	·30
CaO	4·83	·03
Fe_2O_3	·156	·02
Al_2O_3	·134	—
CO_2	2·64	—
SO_3	1·91	2·2[2]
P_2O_5	1·57	1·82
Cl	·22	·27
SiO_2	·90	—

A comparison of these numbers shows that the sample contains abnormally high percentages of lime and carbonate. The only plentiful supply of lime in the body is bone, but the ratio of phosphoric acid to lime in bone is 1 : 1·3 (approximately), whereas in the present case the ratio is 1 : 3, showing that the presence of lime cannot be attributed to this source, and therefore the lime must have been introduced from without.

Although it is difficult to speak with certainty on this point, it would seem reasonable to suppose that the lime which is at present combined in the form of carbonate must have been originally added in the form of quicklime, since the addition of calcium carbonate, as such, could serve no useful purpose in embalming.

(1) *Zeitschr. Physiol. Chem.*, ix. 61.

(2) This number does not represent the actual amount of sulphuric anhydride present in the muscle, but the amount which would be formed by the complete oxidation of all the sulphur in the muscle.

The presence of alumina is striking, inasmuch as this substance is not a normal constituent of the body ; the percentage is small, but, if the body had merely been bathed in a solution of an aluminium salt, one would not expect to find much.

There is also a small quantity of silica present, due most probably to the chance introduction of some sand.

The amount of soda present precludes the possibility of any sodium salts, such as chloride or carbonate, having been added.

The following is an analysis of the inorganic constituents of the debris of the mummy of Nekht-Ankh :—

	No. 1. Nekht-Ankh.	No. 2. Khnumu-Nekht.
K_2O	·77	1·21
Na_2O	9·03	·24
CaO	·90	4·83
Fe_2O_3	·27	·156
Al_2O_3	·90	·134
CO_2	traces	2·64
SO_3	2·99	1·91
P_2O_5	·42	1·57
Cl	1·89	·22
SiO_2	5·80	·90

A comparison of these figures with those obtained from the mummy of Khnumu-Nekht justifies the conclusion that the method of embalming adopted in the two cases was not the same.

The high percentage of calcium carbonate, which was a striking feature of the sample No. 2, is very much reduced in the present case, while the percentages of soda, sulphates and chlorides are considerably increased. Of the total soda present only about half is combined with the inorganic acids ; the remaining half, which is combined with organic acids, was most probably originally added in the form of carbonate, which has in the course of time been altered by the action of acids produced from the decomposition of organic materials.

The substance analysed was quite damp, and on drying at 100° lost 16 per cent. of moisture. The damp condition must be attributed to the hygroscopic properties of impurities in the chloride of sodium which was undoubtedly added in this case.

Since the above analyses were made, I have had an opportunity of reading Prof. Hübner's Report (pp. 72-80). It must be remembered that our analyses are not comparable for they dealt with different material. I cannot accept the suggestion

that the lime found in Khnumu-Nekht's débris "has been introduced through fibre residues containing lime" (Prof. Hübner's report, p. 74), since there were a number of small but conspicuous white fragments of calcium carbonate in the sample which obviously never came out of the cloth. Moreover, it appears from page 73 of the same report that where the quantity of lime was large there was always a large quantity of iron or alumina, a relation which is not at all borne out by my analyses.

Note on the Salt.

By Professor H. B. Dixon, F.R.S.

The dust and debris from the mummy of Nekht-Ankh contained small lumps of a whitish salt, soluble in water.

This salt was tested for carbonate, sulphate, nitrate, borate, acetate, phosphate, and chloride. It contained a little chloride, but none of the other acids were present in appreciable amount.

The salt dissolved in water, forming a very slightly alkaline solution, which passed slowly through filter paper.

On acidifying with strong acids an amphorous, whitish precipitate was thrown down, soluble in alkali. On evaporation a rather gelatinous residue was left; but on resolution and evaporation long, needle-like prisms were obtained.

The solution formed a fine froth on shaking, and behaved like a soap solution.

The base was soda, only a trace of ammonia being evolved when the solution was warmed with caustic soda.

On heating, the salt charred and burnt, leaving an alkaline residue, largely composed of sodium carbonate.

On heating the salt with caustic soda it gave off ammonia.

The substance is therefore the sodium salt of an organic acid containing nitrogen.

Analysis of Mummy Dust of Khnumu-Nekht.

By Ernest Linder, B.Sc.

THE material was non-homogeneous; it contained, in addition to fine brown dust, pieces of skin, fibre, and a white substance resembling "plaster." The dust was prepared for analysis by teasing out with a pin all visible particles of

skin, fibre, and "plaster," leaving the fine brown dust associated with particles of "plaster" too small to remove without prolonged treatment. It is estimated that the specks of "plaster" remaining after this treatment would not exceed, say, one-half per cent. by weight of the powder analysed.

No completely satisfactory method of analysis could be devised. Extraction with hot water produced a brown solution in which the presence both of chloride and sulphate could be detected by dialysis; but the removal of the organic matter, either by dialysis or by oxidisers, so as to obtain a solution convenient for titration with N/10 $AgNO_3$, proved to be impossible.

The following procedure was ultimately devised :—

1. The dust (prepared as described above) was heated to low redness in covered crucible to drive off volatile matter.

Loss of Weight = "Volatile."
Residue = "Fixed Carbon" and "Ash."

2. The "Residue," so obtained, was further ignited at low redness with admission of air until the carbon was burnt off, and the ash treated with ammonium carbonate to convert lime and magnesia into carbonates—

Ignited Residue = "Ash" (carbonated).

3. The "Ash" was then extracted repeatedly with boiling water, and the filtrate made up to a definite volume after exactly neutralising with N/10 HCl.

(*a*) Solution contains, practically, the whole of the alkalies, together with fixed sulphuric acid.

(*b*) Residue left undissolved contains, practically, the whole of the lime, magnesia, etc.

4. A separate portion of "Ash" was treated with dilute nitric acid, and the chloride determined by titration with N/10 $AgNO_3$, chromate indicator.

5. Total sulphur and silica were determined by fusing the dust with carbonates and nitre. The silica so obtained was approximately identical in amount with that present in the insoluble residue left after evaporating the "ash" with hydrochloric acid, &c.; it appeared to be present in the dust in the form of sand.

6. Soda and potassa were weighed together in the form of sulphates, and the potassa then separated by the platinum chloride method.

The results of analysis are given below, expressed as parts per 100 of undried dust (separated as described above from "plaster," skin, and fibre).

Attention is drawn to the following points :—

1. The figure for sodium chloride (0·53) is calculated from the equivalent of chlorine found by titration with N/10 $AgNO_3$.

The equivalent of soda (Na_2O) calculated from this is 0·28 per cent.
(Na_2O) found 0·30 „

2. The figure for potassium carbonate (1·61) is calculated from the alkalinity determined by titration with N/10 HCl.

The figure for potassium sulphate (1·15) is calculated from the equivalent of sulphate determined gravimetrically by precipitation with barium chloride.

The equivalent of potash (K_2O) calculated from these is 1·72 per cent.
(K_2O) found 1·54 „

3 The Alumina, as sulphate, is equivalent to 1·25 per cent SO_3 (volatile).
The Potassium sulphate „ „ „ ·53 „ (fixed).
Calculated 1·78 „
Total sulphur by fusion method Found 1·79 „

The effect of ignition at low red heat upon the various constituent salts and acids cannot be determined. The dust evolves, first, ammonia, then combustible gases, which burn, like bitumen, with a yellow flame. No ammonia was obtained on distilling the dust with water into standard N/10 H_2SO_4.

PER 100 PARTS OF DUST.

Loss at 100° C in air oven	5·00	
" Volatile " (after drying as above) ...	65·83	(Soluble in CS_2 8·43).
" Fixed Carbon "	18·14	
" Ash " (carbonated) 11·03 :—		
Silica (SiO_2)	·87	
Iron Oxide (Fe_2O_3)	·13	
Alumina (Al_2O_3)...	·53	
Calcium Carbonate ($CaCO_3$) ...	5·08	(CaO 2·84)
Magnesium Carbonate ($MgCO_3$)	·65	(MgO ·31)
Sodium Chloride (NaCl)	·53	
Potassium Carbonate (K_2CO_3)...	1·61	
Potassium Sulphate (K_2SO_4) ...	1·15	
Difference	·48	
	100·00	

[Herodotus and Diodorus have until recently been accepted as the chief authorities on the ingredients used in embalming and the methods of using them. Herodotus says that an incision was made in the side of the body, the internal organs removed, and the cavity filled up with myrrh and other spices, and that then the body was placed in a bath of natron for seventy days. The three methods which he describes differed apparently a good deal in expense, but varied only in the method of treating the internal organs and in the bandaging, the real preservative —the natron—being used in the same way and for the same length of time in each case. Diodorus' account is very similar. He also states that sweet-smelling drugs and spices were used in embalming.

These two statements have been generally accepted[1] until quite recently for all pre-Ptolemaic mummies; these last, being preserved with bitumen or resin, are easily distinguished from the earlier mummies.

Dr. Elliott Smith, however, has investigated the preservatives employed in the embalming of bodies in the XXIst dynasty, and appears to come to the conclusion that common salt (chloride of sodium) was the preservative used.[2] He does not appear to have found natron, which chiefly consists of native carbonate, together with a little sulphate and chloride of sodium (from the natron lakes).

It seems to me, therefore, desirable to publish all the analyses in detail. For not only are these mummies earlier in date than any which have been examined hitherto, but they were brothers and buried in the same tomb; therefore there can only be a few years' difference in date (not long enough for any change to take place in the methods of embalming) and the conditions of temperature and atmosphere have been the same for both bodies since the interment. The marked difference between the two (the moistness of the one and the dryness of the other) pointed at once to a difference in preservative, which is clearly shown in the analyses :—impure common salt in one case, lime in the other.

But there is one important point in both cases, and that is the use of alum, which, I think I am right in stating, has not hitherto been observed in any other mummies. It seems probable that both bodies were steeped in an alum bath before the special preservative, peculiar to each, was applied.

Our knowledge of the methods of mummification is still so slight that it is impossible to say whether the use of alum was a characteristic of the twelfth dynasty or a local peculiarity. M.A.M.]

(1) Budge, "The Mummy," pp. 182-4.
(2) *Annales du Service*, 1906, p. 161.

8. THE BANDAGING.

NEKHT-ANKH.

1. A sheet was laid over the body, slit from the feet to the thighs, and tucked in over the head, hands, and feet. It was in bad condition, therefore the original length was not obtainable. Size: 0·712 m. wide.

2, 3. The feet were wrapped separately, both alike. The bandage began at the sole of the foot, and was taken four times round the foot, figure of eight twice round foot and ankle, then upwards round the leg ending at thigh. Size: No. 2, 3·152 × 0·119 m. No. 3, 3·139 × 0·108 m.

4. This bandage covered the head, beginning at left side of neck, round the neck, over top of head, round neck again, over the face, and round head. The end was tucked in under the last fold at the right cheek. Size: 2·986 × 0·121 m.

5. This bandage was a good deal broken, and only part of the arrangement could be observed. It had passed over the head and face and was tied in a reef-knot under the chin. Size: 15·3 cm. wide. The length could not be measured.

6, 7. These arm bandages were broken at the elbow, but they appear to have continued down to the hands.

Right hand. The end was folded over the tips of the fingers, beginning at the back of the hand, twice round the fingers, then upwards round the arm, and over the right shoulder. Size: Width, 8·3 cm. probable length about 2 metres.

The bandaging of the left arm was slightly different. The bandage began at the thumb, was then carried round the fingers, round the palm, and upwards round the arm to the shoulder, passing twice over the shoulder and under the armpit and ending at the shoulder. Size: Width, 8·9 cm. probable length about 2 metres.

8. Begins at right shoulder, round the neck, over right shoulder and arm, over chest to left side, under left armpit, round arm, under armpit again, and ends at left side of neck. Size: 1·736 × 0·102 m.

9. Beginning at right side of feet, three times round the feet, under heels, over the top of the feet, round feet again, then upwards round legs to left knee where it was knotted to No. 9. Size: 6·291 × 0·122 m. For knots, see Pl. 2., fig. 2.

10. Upwards round the legs, over hands and arm, ends at hips. Size: 2·283 × 0·121 m.

11. (Numbered 37 in Pl. 7). Begins at back of ankles, upwards round the legs, knotted at right thigh to No. 12. Size: 1·347 × 0·134 m. Slit for knot 5·1cm. from end, length of slit 16·5 cm.

12. (Numbered 36 in Pl. 7). From right thigh upwards round body to waist. Size: 1·805 × 0·121 m. Slit for knot 4·9 cm. from end, length of slit, 12·1 cm.

13. Round the body upwards. Size: 2·605 × 0·115 m. Selvedge at one side and one end.

14. This bandage was much broken, but it could be traced over the chest and neck, and apparently continued the bandaging as far as the neck, then down again to the chest, and ended at the back where it was knotted in a reef knot to No. 15. Size: 0·127 m. wide. Slit for knot, 3·8 cm. from end, heading at slit end.

15. Begins at back and continues the bandaging of the chest. Size: 0·775 × 0·134 m. Slit for knot, 5·7 cm. from end. Length of slit 19·1 cm. long, heading at slit end.

16. Begins at the back, continues the bandaging of the chest, passes under neck, and ends at left shoulder. Size: 1·144 × 0·134 m.

17. Begins at lower part of back, upwards to left shoulder, round neck to right shoulder, then to left hip. Size: 3·5 × 0·134 m.

18. A sheet covered these bandages, the ends wrapped over the feet and head; one corner of the sheet being at the left side of the feet. Size: 2·586 × 1·163 m.

19. A bandage kept the sheet in place over the head, beginning at the left side of the back of the neck, passing round the neck, twice round the head over the face, over the top of the head, round the lower part of the face, the ends split and tied in a reef knot under the right ear. Size, 4·29 × 0·99 m. Length of split, 0·41 m.

We now come to a series of bandages knotted together and applied in a peculiar manner.

20. Beginning at right side of feet, figure-of-eight twice round feet and ankles, round legs upwards to hips, reversed on upper part of the legs and again at the right side, knotted at right hip to No. 21. Size: 6·99 × 0·191 m. Slit for knot, 7·8 cm. from end, length of slit, 7·8 cm.

21. Begins at right hip, upwards round body, under neck, over right shoulder, straight down the body to left ankle, under feet to right ankle, straight up the body to left shoulder, under neck to right shoulder, and knotted to No. 22 at *right* side under ribs. Size: 6·7 × 0·14 m. Slits for knots at No. 22 end, 7·6 cm. from end, length of slit 20·4 cm.; at No. 20 end, 8·9 cm. from end, length of slit 19·1 cm. Fringe at end, 13 cm. long.

22. (Numbered 21 in Pl. 7). From the knot at right side to left shoulder, straight down the body to left ankle, under feet from right ankle up the body to right shoulder, over head to left shoulder, down the body to left ankle, under feet to right ankle, up the body to right shoulder, round head to left shoulder, down the body, and knotted to No. 23 on *left* side below ribs exactly opposite the knot which fastens Nos. 21 and 22 together. Size: 7·167 × 0·14 m. Slits for knots, at No. 21 end, 5·1 cm. from end, length of slit, 21·6 cm.; at No. 23 end 5·1 cm. from end, length of slit 15·3 cm. For knots, see Pl. 7.

23. (Numbered 20 in Pl. 7). Down the body to left ankle, under feet to right ankle, up the body to right shoulder, over head to left shoulder, down across the body to right ankle, under feet, from left ankle to right shoulder, round head to left shoulder, fastened to No. 24 at left side of pelvis. Size: 7·193 × 0·153 m. For knots, see Pl. 7.

24. (Numbered 17 in Pl. 7). From pelvis to right ankle, under feet, from left ankle to left shoulder, round head, from right shoulder to right ankle, under feet, from left ankle to left side of chin, twice round neck, split at end and tied in a reef knot at right side of the chin, the long end of the bandage being tucked in under the last folds. Size: 6·837 × 0·159 m. Length of split, 79·1 cm. Slit for knot 7·6 cm. from end; length of slit, 15·3 cm.

The next two bandages keep the long ones in position.

25. Begins at back of ankles, upwards round body, ends at left side. Size: 7·167 × 0·152 m.

26. Round body upwards, passing under the body from left to right, end of bandage tucked in under the last fold at chin. Size: 3·37 × 0·108 m.

27. A slit was made at one end of the bandage 6·3 cm. from the end, so as to form a loop which was slipped over the feet. The bandage then went from left ankle to left shoulder, over head, from right shoulder to right ankle, under feet, from left ankle to left shoulder, over head, from right shoulder to left ankle, where it was knotted to No. 28. Size: 6·977 × 0·178 m.

28. From left ankle under feet, from right ankle to left shoulder, over head, from right shoulder to left ankle, under feet, from right ankle to left shoulder, under neck from right shoulder to left ankle, slit at end and knotted. Size: 7·167 × 0·127 m.

29. Square of linen folded as a pad over toes. Size : 0·676 × 0·737 m. ; selvedge on one side.

The next two bandages hold the pad and the long bandages in position.

30. Begins at heels, twice from heels to top of feet, figure-of-eight twice round feet and ankles, upwards round legs, ends at left thigh. Size : 7·409 × 0·165 m.

31. Begins at thighs, upwards round body, split in two, and the ends fastened round the neck in a single knot. Size : 5·967 × 0·114 m.; length of slit, 38·1 cm.

32. Slit at end to form a loop through which the feet were passed, up right side of body, over top of head, down left side, under feet, up right side, over head, down left side to ankles, split in two and the ends tied in a single knot under the feet. Size : 7·129 × 0·108 m. Length of split 49·6 cm.; length of slit going over feet, 28·6 cm.; from end of bandage, 5·1 cm.

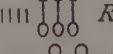
33. Slit at end to form a loop through which the feet were passed, up right side of body, over head, from left shoulder to right ankle, under feet, from left ankle to right shoulder, over head, from left shoulder to right ankle, under feet, ends at left side of feet. Size : 7·269 × 0·14 m.; slit, 26·7 cm.; from end of bandage, 3·8 cm.

34. Slit at end to form a loop through which the feet were passed, from left ankle to left shoulder, round back of head, from right shoulder to left ankle, under feet, from right ankle to left shoulder, round head, from right shoulder to left ankle, under feet, round feet, ends in front of ankles. Size : 8·108 × 0·95 m. Length of slit, 29·9 cm., from end of bandage, 9·5 cm.

35. Begins at ankles, upwards round legs and body. Size : 6·99 × 0·153 m.

36. Begins at shoulders, upwards round shoulders and neck, end tucked into folds of head bandages. Size : 3·05 × 0·184 m.

37. Sheet folded lengthways as a pad from chin to ankles. Size : 2·859 × 1·242 m.

On one sheet among the wrappings of each mummy are inscriptions written in ink. In both cases the hieroglyphs are in the two corners of the fringed edge of the sheet and on opposite sides of the cloth. In one corner of this sheet the hieroglyphs are  *Rnpt* 4 *nfrw* written horizontally; in the other corner the signs are *ḥ'tī 'nḫwī*, written vertically (Pl. 17). The first inscription gives both the date of weaving and also the name of the quality of cloth. In the XXIst dynasty[1] it was customary to date the bandages of royal and noble personages by the year of the king's reign : the king's name is, however, occasionally omitted[2] as it is here. The sheets of Nekht-Ankh and Khnumu-Nekht

(1) Daressy, *Revue Archéologique*, vol. 28, pp. 75-78.

(2) *Id., ib.*, p. 77. No. 105.

11. The whole course of this bandage could not be traced. It came from the left shoulder down the middle of the back, passed between the legs so as to hold No. 9 in position, and went up the front of the body. Size: (approx.) 0·6 × 0·23 m. Between the legs it was twisted to a rope, 38 mm. in diameter.

12. *Left Leg.* Round toes twice from right to left, round foot, round heel, figure of eight round foot and ankle, upwards round leg to thigh. Size: (approx.) 1·2 × 0·09m.

13. *Right Leg.* Beginning at right side of foot over instep twice, under heel, figure of eight round ball of foot and ankle, round the ankle, up the leg to thigh. This bandage was much broken, and though the course could be traced the length could not be measured. Width: 0·09 m.

14. A mass of woven fringe torn from a sheet and a long narrow strip of cloth roughly squeezed together to form a pad between the legs. Size: 7·739 × 0·064 m.; fringe, 2·313 × 0·41 m.

15. The feet and legs were tied together with a strip of woven fringe torn off a sheet similar to No. 23. The feet were tied at the insteps, the legs at the calves and again above the knees. Length, 1·03 m.; width of fringe, ·41.

16. *Right hand.* Folded over top of thumb, round thumb downwards, end tucked in at root of thumb. Size: 0·369 × 0·032 m.

17. Begins at middle of index finger, upwards over tip of finger, then downwards to root of finger, crosses to middle finger, upwards to tip of finger, and the end brought down and tucked in under fold at root of finger. Size: 1·106 × 0·032 m. Length of bandage for index finger, 0·725 m.

18. Begins at tip of little finger, downwards, crosses to third finger, upwards round finger, end broken. Size: 0·839 × 0·025 m.

19. *Left hand.* Bandage of thumb. Selvedge down one side. Size: 0·801 × 0·032 m.

20. End folded flat over tip of third finger, downwards round finger. Bandage full width at tip of finger, twisted to a rope after, 0·23 m. Selvedge at one end. Size: 0·547 × 0·032 m.

21. Bandage of little finger. Size: 0·509 × 0·035 m. The bandages of the left hand were in a particularly friable state, and no notes were obtainable for the index and middle fingers.

The bandages of the trunk and of the head were badly broken, and it was quite impossible to follow the course of the bandages completely, though sufficient remained to show the main course. See Pl. 4, fig. 2.

22. Sheet folded in the middle, top to bottom, then doubled the same way. Turned in so that the weft-selvedges come underneath, one at feet, one at thighs. Laid as a pad from the top of thighs to the tips of the toes. Retains the mould of the form underneath. Size: 2·561 × 1·245 m. Length of selvedge fringe, 0·13 m. See Pl. 4, fig. 3.

23. Sheet, probably laid under the whole body from head to foot; completely broken at upper part, but can be traced over the arms. Is brought over the legs, right edge over left edge; end turned over feet. Cord selvedge at end, fringe selvedge at side. Size: (approx.) 1·7 × 1·2 m. As this sheet enclosed the arms and the legs, the body must now have assumed the appearance of a bandaged mummy.

24. Beginning at right side of ankles, under the ankles, figure of eight round feet, round feet again, figure of eight round ankles, round feet, round the legs upwards to thighs. Size: 8·375 × 0·115 m.

25. Beginning not traceable, appears in the middle of the back, round the body downwards, ending in front of the hips. Size: (approx.) 1·5 × 0·1 m.; selvedge on one side.

26. Beginning not traceable, appears on right side of body, round body upwards, twisted at right angles on chest, goes straight upwards and is broken off at the neck. Size: from one end to twist 0·839m., from the other end to twist, 1·29 × 0·1 m.; selvedge one side. See Pl. 6, fig. 3.

27. Pad folded into four breadthways, then doubled lengthways. Left side lower part of body and upper part of thigh. Size: 0·509 × 0·726 m.; selvedge on one side, cord-selvedge at one end.

28. Mass consisting of narrow strip of cloth with woven fringe, roughly crushed together to form a pad filling up the hollow between the legs in front. Size: 1·04 × 0·051 m.; width of fringe, 0·38 m.

29. Pad, folded inwards from sides to middle, then folded down middle. Folds very irregular. Laid over the front of the body and upper part of the thighs Selvedge at one end. Size: 1·42 × 0·966 m.

30. This bandage appears to have been applied like a sling; unfortunately the upper parts could not be traced, and it was impossible to say where it began and where it ended. It started at the upper part of the body, was brought down the front of the body, passed under the feet and went up the other side of the body. The part which passed over pads Nos. 27 and 29 was folded to about a quarter its width. Both parts of the bandage inclined to the left side in passing along the body. Size: (approx.) 2·2 × ·1 m.; width at narrow part 0·03 m.

All the following bandages as far as No. 35 were broken at the upper part of the chest, their course can be followed only over the lower part of the body and the legs. They appear to have been like the long bandages Nos. 21-28 of Nekht-Ankh.

31. From front of neck down the body to the feet, split into two tails which pass down either side of the feet and are knotted in a reef knot under the feet. Size: (approx.) 1·4 × 0·1 m. Length of split, 0·5 m.

32. From the neck down the middle of the back to the feet, split into tails, which pass twice in opposite directions round the feet and are then knotted in a reef-knot over the insteps. Size: (approx.) 1·5 × 0·1 m. Length of split, 0·725 m.

33. A greatly broken bandage which had passed down the front of the body and under the feet. It had been squeezed in one place to about a quarter its width, in another place to about an eighth of its width. Size: (approx.) 2·0 × 0·1 m.; at narrow parts, 26 mm. and 13 mm.

34. From neck down right side of body, split into tails which pass on either side of the feet and are tied in a reef-knot under the feet. Size: (approx.) 1·3 × 0·1 m. Length of split, 0·4 m.

35. This bandage is applied like a sling, passing down the front of the body and forming a loop round the feet. The upper ends of the bandage are squeezed together till it looks like a string; on the right side at a distance of 0·394 m. from the feet, the width is 1·9 cm. for about half a metre; on the left side at a distance of 0·458 m. from the feet, the width is 1·9 cm. for about 0·153 m. Size: (approx.) 2·2 × 0·09m. See Pl. 7, fig. 1.

36. Beginning at the instep, under feet from left to right, reversed at heels, round ankles, upwards round legs and thighs, ends at lower part of body. Size: 4·98 × 0·1 m.

37. Round body downwards, end tucked in under last fold at middle of chest. Size: (approx.) 4·88 × 0·1 m.

38. Upwards round body, ends at middle of back. Size: 5·169 × 0·14 m.

39. Pad folded breadthways in middle, folded breadthways again, then folded in half lengthways; folds not even. On left side of body. Size: 0·928 × 0·502 m. Selvedge on one side.

40. Begins at right side of feet, over the toes, round the feet, and then broken. Size: (approx.) 1·0 × 0·17 m.

41. Begins under the feet, straight up the right side to the calf, round legs downwards to ankles, round the feet in figure of eight, round the heels, upwards round

the legs, knotted at back of body to the next bandage. Size: 8·266 × 0·128 m. One end cut in a fish-tail.

42. This bandage probably went round the body over the chest. It was broken at both sides so that the chest portion came away in one mass. Measurements were impossible.

43. Pad folded breadthways, sides into middle, folded down the middle, then doubled in half lengthways. Behind left arm-pit and ribs. Size: 0·671 × 0·984 m.

44. Round body downwards, end tucked in under last fold at left side of back. Size: (approx.) 2·2 × 0·11 m.

45. Straight strip down back of legs, under heels, over tips of toes. Size: (approx.) 1·4 × 0·06 m.

46. Pad folded lengthways in half, folded lengthways again in half, end folded over. Up left side of legs from ankles; upper part completely destroyed. Selvedge on one side. Measurements were impossible.

47. Begins at right side of ankles, round feet and ankles in figure of eight, upwards round legs and body. This bandage and the next hold pad No. 46 in place. Size: (approx.) 5·3 × 0·095 m.

48. Over top of feet, round heels, round feet and ankles in figure of eight, reversed at right side of foot, round feet and ankles, end broken. Size: (approx.) 3·2 × 0·13 m.

49, 50. From left shoulder to right thigh, round back, from left side towards right shoulder. These bandages were badly broken, and it was only from the difference in weaving that it was possible to tell that there were two. Size: No. 49 (approx.) 0·9 × ·11 m.; No. 50 (approx.) 1·0 × 0·11 m.

51. Round neck, from right shoulder to left thigh, round the back, both ends broken. Size: (approx.) 1·05 × 0·11 m.

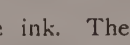
52. From legs upwards round the body. Size: (approx.) 5·7 × 0·12 m.

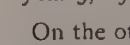
Down the left side from hip to knee was a narrow depression in the bandages as though something had pressed against them. In the depression were some small fragments of stucco.

The outer wrappings had been removed previously and there is no record as to their position on the mummy. They are lettered for reference:—

A.—Size: 0·775 × 0·572 m. Selvedge on one side.

B.—Size: 2·186 × 0·635 m. Woven fringe on one side, length of fringe, 0·21 m. Selvedge on one side.

On each side of this sheet near the fringed edge, hieroglyphs are written in ink; on the one side the cloth appears to have been folded over while the ink was still wet, and the impression of the characters is so far traceable that the inscription is fairly readable in spite of the tattered condition of the cloth, which appears to be due to the action of the ink. The hieroglyphs are  *Rnpt 3 nfrwï*, "year 3, *neferui*-cloth."

On the other side at the other end of the sheet the ink has corroded the cloth so much that it is not possible to be certain of all the signs. They appear to read  *w'b ° nfrwï*, "the great *uab*-priest, *neferui*-cloth." See Pl. 17.

C.—Size: 0·686 × 0·635 m. Woven fringe on one side, length of fringe, 0·21 m.

D.—Size: 0·622 × 0·696 m. Selvedge on one side.

E.—Size: 0·699 × 0·699 m. Woven fringe on one side, length of fringe, 0·32 m.

F.—Size: 1·157 × 0·534 m. Woven fringe on one side, length of fringe, 0·16m.

G.—Size: 0·775 × 0·718 m. This appears to have been the outermost wrapping.

The bandages were first numbered in the order in which they were removed from the mummy. This was done merely to keep the record. But in publishing I have numbered the bandages in the order in which they must have been put on, making No. 1 the one nearest to the body. The photographs were taken with the old numbering; this has, however, been rectified in the text.

9.—THE MUMMY WRAPPINGS.

By Thomas W. Fox, M.Sc. Tech.

ALL the wrappings from the Mummy No. 1 have been carefully analysed, with the exception of No. 38, and of that no sample was furnished. Before the correct count, or fineness of the warp and weft threads, could be determined, the samples had to be cleansed from adhering impurities, and, after cleansing, the yarns in Nos. 7, 14, 21, and 29 could not be tested for count. The wrappings from Mummy No. 2 differ in no essential from those of No. 1, consequently no detailed analysis has been given.

Several features in the yarns analysed render them unlike any description of Egyptian mummy-cloth with which I am acquainted. They are all made from flax, but, with two exceptions, are not remarkable for fineness, neither are the textures unusually close or beautiful.

The finest yarns are in Nos. 41, 42, and 1 ; the counts of the warps are, by the present method of computing linen, 116, 107, and 84 leas, or 34,800, 32,100, and 25,200 yards in a pound respectively. The counts of the wefts are: 124, 116, and 56 leas, or 37,200, 34,800, and 16,800 yards in a pound respectively. The highest count of warp in the remaining pieces is in specimen No. 17, and equals 52 leas, or 15,600 yards in a pound ; and the finest of the wefts is in specimen No. 18: it has 54 leas, or 16,200 yards in a pound. The coarsest warp is in Nos. 32, 34, and 37, and equals 12 leas, or 3,600 yards in a pound. The coarsest weft is in No. 33, and equals 9 leas, or 2,700 yards in a pound. The average count of all the warp yarn equals 34·35 leas, or 10,305 yards in a pound, and that of all the weft is 32·21 leas, or 9,663 yards in a pound.

Details concerning each piece will be found in the appended table of analysis.

In 1834 James Thomson, F.R.S., wrote a paper on mummy-cloths, in which the fabrics he examined are described.[1] The yarn of one was found to be

(1) *Lond. & Edin. Phil. Mag.*, vol. 5, p. 355.

"remarkably even and well spun." The weft threads were single, those of the warp two-fold. The fineness of the folded threads, estimated by the linen method, was 84 leas, or 25,200 yards in a pound; therefore each single thread equalled 168 leas, or 50,400 yards in a pound. Some samples "were thin and transparent, and of very delicate texture." The finest appeared to be made of yarns of nearly 280 leas, or 84,000 yards in a pound.

Specimen No. 41, from Mummy No. 1, contained the finest yarn. Where the threads in that fabric are two-fold they equal 116 leas; therefore each strand equals 232 leas, or 69,600 yards in a pound. It will be seen that this is coarser than one of the yarns found by Thomson.

For a time I was at a loss to account for many peculiarities in the warp and weft threads found in these fabrics. In places they are undoubtedly folded, while other parts of nearly every thread appear to be single. At first my colleagues, Mr. William Myers and Mr. Hugh Fairclough, and I were of the opinion that a series of fibres had been placed parallel and twisted into a short thread; then, after twisting another set of similar fibres, one end of each set was overlapped, and both twisted together. This would mean the gradual building up of a continuous thread from a number of short sections, and only at the overlapping points would it be two-fold. After further examination, however, we came to the conclusion that the appearance of many of these threads was due to the irregular distribution of the spinning twist in each single thread, and to the small number of convolutions in a given length of thread. For, assuming two such strands to be twisted together in the opposite direction to the twist in each single, the folding twist will remove all the spinning twist from the lightly twisted portions of each single thread, and thus allow the fibres of both to mingle, as in single yarn spun to-day from double rovings. In those places, however, where the twist in one, or both, singles is plentiful, enough of this will remain to keep the strands distinct. But where one strand is well twisted and the other lightly twisted, the appearance will be that of a fine thread twisted with a coarse one. Threads possessing all the above-named characteristics are to be found in abundance. Yet both hypotheses are insufficient to account for all the irregularities in these yarns. Some are three-fold in places, as in No. 6 (Plate 9); two-fold in others, as in Nos. 10, 11; while knots unite a two-fold with a two-fold, as in No. 3, or with a single, as in No. 5. Some single yarns are twisted to the right, as in No. 10, some to the left, as in No. 11, and the twist in the folded yarn is sometimes in the same, at other times in the opposite, direction to that in the singles, as in Nos. 11 and 10 respectively. So varied and so numerous are the irregularities that it is impossible to place these yarns on a level with the best yarn of the present day; nevertheless, Thomson says the cloths he examined "prove the arts of spinning and weaving flax to have attained a high degree of perfection, many of the specimens being of a quality to excite admiration even at the present day, the finest of these fabrics approaching in excellence our

delicate muslins." He further remarks: "The great mass of mummy-cloth employed in bandages and coverings is of coarse texture, especially that more immediately in contact with the body. The upper bandages nearer the surface are finer. Sometimes the whole is enveloped in a covering, coarse and thick, and very like the sacking of the present day; sometimes in cloth, coarse and open like that used in our cheese-presses, for which it might easily be mistaken." In the "Encyclopædia Britannica," ed. 9, article "Mummy," it is stated that "the texture varied with the rank of the mummy, some being as fine as the finest India muslin, and some extremely coarse. The quantity used was enormous, and persons used to save their old linen for this purpose all their lives long."

Doubtless different methods of preserving human and other bodies obtained in different parts of Egypt, as well as at different periods. On this account it would be a hazardous proceeding to generalise from a single mummy. It is certain the wrappings on No. 1 mummy were not placed as stated by Thomson, for specimen No. 1 is a sheet which was employed to cover the whole body, and is one of the finest of the series, also, if Nos. 1, 18, 41 and 42 are omitted by reason of their abnormal fineness, the remaining pieces fall into two groups, namely:—Nos. 2 to 17, and Nos. 19 to 40. The former were placed nearest the body and contain the finest materials, as well as the greatest number of warp and weft threads on an inch. Thomson's statement is confirmed by No. 41, which is a sheet, and the finest texture of all. It was placed at the outer surface and laced down the back with No. 42, a strip of fringe torn from a larger piece and twisted to form a lace. No sacking, or cloth similar to that used to cover cheese was found.

In the majority of pieces submitted to me it is impossible to determine whether or no decay is due to other causes than those arising from the tomb itself. But I have examined many hundreds of recently recovered Egyptian fabrics in which there is ample evidence that new cloths were not alone used to cover the dead. Some of those fabrics are so much darned that it is difficult to decide what the original texture was like. Others bear unmistakable signs of wear, still, they are comparatively modern productions; they are supposed to date between 100 B.C. and 1100 A.D., and old customs may have given place to new ones. In the present case, however, there is other evidence in support of the statement that old linen was used as mummy wrappings. For example, several pieces of woven fringe were torn from the fabrics to which they belonged and roughly squeezed together into pads, as in No. 14, Mummy No. 2 also to make strips for tying the bandages in position, as in No. 15, Mummy No. 2, and to form a lace as in No. 42, Mummy No. 1. If fringed fabrics were necessary for mummy wrappings it is unlikely that they would be torn up in the above-named manner. Further, the great diversity of textural construction found in these cloths leads to the conclusion that anything available was used.

No wool was found either on Mummy No. 1 or No. 2, nor have I found woollen fabrics amongst very ancient mummy-cloths. But I have found numerous woollen fabrics in those discovered in Middle Egypt, in the neighbourhood of El-Fayúm and of Akhmím, also in or around the Arab village of Sakkarah, near Memphis.

All the fabrics taken from Mummies No. 1 and No. 2 confirm Thomson's statement regarding the structure of Egyptian mummy-cloths. He says they "had generally twice or thrice, and not seldom four times the number of warp threads to an inch that the woof had. This structure, so different from modern cloth, which has the proportions nearly equal, originated probably in the difficulty and tediousness of getting in the woof."

In the forty-one examples examined the difference between the closeness of the warp and weft threads varies from 1·73 to 5·53 in the warp to 1 in the weft, the average of all the specimens being 2·518 to 1. They also reveal the fact that nothing resembling a reed was employed to manufacture them, for the warp threads are so irregularly disposed as to render anything of the kind impossible. Thus, in specimen No. 41 the threads vary from 83 to 156 on one inch; in No. 18, from 68 to 104, and many other instances will be noticed by referring to the columns in the table of analysis headed "highest and lowest numbers of threads to the inch."

Some Egyptian cloths have what appears to be a selvage on every side, as No. 13. This is due to making the warp from a single thread, and only long enough to form one fabric. In such cases a thread seems to have been wound round two rods to form parallel lines of warp; then the looped ends were either made into fringes by forming the warp into groups of six or more threads, and passing weft alternately over and under the groups, instead of alternately over and under single threads, as in the body of the pieces; or weft was pushed as close to the ends of the loops as the rods permitted, each line of weft being intersected with each thread of warp. Similar fabrics, fringed or otherwise, were made by the ancient Peruvians.

Whether the best of these fabrics are the "fine linens of Egypt" or articles of inferior production is doubtful. Thomson says: "It would be as unreasonable to look through modern sepulchres for specimens and proofs of the state of manufacturing art amongst ourselves as to deduce an opinion of the skill of the Egyptians from those fragments of cloth which envelop their dead, and which have come down, almost unchanged, to our own time. The curious and costly fabrics which adorned the living, and were the pride of the industry and skill of Thebes, have perished ages ago." This may or may not be true when applied to Thebes, but it is certainly inapplicable to many of the fabrics unearthed in Middle Egypt in or about the year 1885, for those fabrics undoubtedly represent the best productions of the Egyptian loom.

My colleague, Mr. Charles W. Gamble, M.Sc. Tech., kindly undertook the preparation of the photo-micrographs, and the photo-engraved block for Plate 9. This Plate shows a number of threads which were taken from specimen F, Mummy No. 2.

No. 1 is a thread which is partly two-fold, partly single, and in which the change is distinctly visible.

Nos. 2 and 7 show a two-fold thread, in which one strand is separated from the other, and terminates.

No. 3 shows a knot uniting one two-fold thread with another two-fold thread.

No. 4 shows a knot upon one strand of a two-fold thread.

No. 5 shows a knot uniting a single thread with a two-fold thread.

No. 6 is a three-fold thread.

No. 8 is a two-fold thread in which one strand gradually disappears.

No. 9 is a thread composed of numerous strands.

No. 10 is a two-fold thread, the single strands of which are twisted to the right, and the folding twist is to the left.

No. 11 is a two-fold thread in which the spinning and folding twists are both to the left.

ANALYSIS OF 41 SAMPLES OF

Number of Sample.	Size of Sample.		< WARP					
	Width in inches.	Length in inches.	Threads per inch 4 Tests.				Highest number of Threads per inch.	Lowe number Threa per inc
1	28·0	60·0	131·0	122 0	99·0	98·0	131·0	98·C
2	4·7	123·8	66·0	62·0	62·0	58·0	66·0	58·C
3	4·3	123·6	68·5	70·0	71·5	67·0	71·5	67·C
4	4·7	117·7	83·0	79·0	78·0	92·0	92·0	79·C
5	4·7	41·0	65·5	77·0	78·0	76·0	78·0	65·5
6	3·1	41·5	54·0	58·0	58·0	63·0	63·0	54·C
7	3·5	64·5	77·0	85·5	70·0	70·0	85·5	70·C
8	4·0	68·5	56·0	55·0	55·0	56·0	56·0	55·C
9	4·7	247·7	68·0	69·0	66·0	66·0	69·0	66·C
10	4·7	89·8	59·0	65·0	61·0	60·0	65·0	59·C
11	5·1	53·3	56·0	58·0	65·0	60·0	65·0	56·C
12	4·7	71·0	82·5	76·0	77·0	71·0	82·5	71·C
13	4·3	102·2	61·0	64·0	67·0	74·0	74·0	61·C
14	5·1	61·0	74·0	67·0	63·0	68·0	74·0	63·C
15	5·1	30·4	70·0	83·0	68·0	66·0	83·0	66·C
16	5·1	45·0	60·0	64·0	70·0	81·0	81·0	60·C
17	5·1	119·9	75·0	70·0	76·0	76·0	76·0	70·C
18	45·6	102·0	104·0	68·0	83·0	92·0	104·0	68·C
19	3·9	158·3	48·0	40·0	32·0	35·0	48·0	32·C
20	7·6	274·9	25·0	30·0	40·0	56·0	56·0	25·C
21	5·5	254·0	67·0	49·0	49·0	47·0	67·0	47·C
22	5·5	282·3	46·5	44·0	37·5	39·0	46·5	37·5
23	6·0	283·1	37·0	34·0	37·0	35·0	37·0	34·C
24	6·3	269·3	47·0	51·0	50·0	52·0	52·0	47·C
25	5·9	282·3	42·0	40·0	39·0	39·0	42·0	39·C
26	4·3	119·8	38·0	43·0	44·0	46·0	46·0	38·C
27	7·2	274·8	35·0	36·5	40·0	38·0	40·0	35·C
28	5·1	282·3	40·0	41·0	41·0	42·0	42·0	40·C
29	29·4	26·7	47·0	47·0	41·0	39·0	47·0	39·C
30	6·3	291·7	36·0	37·5	39·0	41·0	41·0	36·C
31	4·4	235·1	44·0	47·0	44·5	42·5	47·0	42·5
32	4·4	280·6	50·0	53·0	53·0	52·5	53·0	50·C
33	5·5	286·3	44·0	41·0	39·0	40·0	44·0	39·0
34	3·5	319·3	41·0	42·0	40·0	39·0	42·0	39·0
35	6·0	275·2	37·0	39·5	37·0	39·5	39·5	37·0
36	7·2	120·7	38·0	36·0	42·0	33·0	42·0	33·0
37	48·8	112·6	44·0	42·0	46·0	43·0	46·0	42·0
38	51·5	99·1	—	—	—	—	—	—
39	6·3	270·5	37·0	40·0	39·0	40·0	40·0	37·0
40	6·8	96·0	36·0	37·0	31·0	38·0	38·0	31·0
41	60·2	68·1	153·0	102·0	156·0	83·0	156·0	83·0
42	1·6	120·8	152·0	158·0	148·0	148·0	158·0	148·0

NOTE.—The widths and lengths expressed in incl

MUMMY OF NEKHT-ANKH.

Yards per pound.	Threads per inch 4 Tests.				Mean number of Threads per inch.	Count number Linen basis.	Yards per pound.	Ratio of Warp Threads to Weft Threads.
	WEFT							
25200	36·5	39·5	38·5	37·5	38·0	56	16800	2·97
10500	35·5	33·5	33·0	33·0	33·8	35	10500	1·83
12600	32·5	30·0	30·0	32·0	31·1	36	10800	2·23
12300	36·0	34·0	32·0	31·5	33·4	45	13500	2·48
11400	34·0	33·0	32·5	33·0	33·1	43	12900	2·24
12600	27·0	28·0	29·5	30·0	28·6	36	10800	2·04
—	31·5	32·0	31·0	31·5	31·5	—	—	2·40
12000	32·0	32·0	32·0	32·0	32·0	43	12900	1·73
13200	35·0	32·5	33·0	33·0	33·1	43	12900	2·03
12900	29·5	31·5	29·0	31·0	30·4	38	11400	2·00
9600	31·5	31·0	30·0	29·5	30·5	28	8400	1·95
11700	29·5	31·0	30·0	29·0	29·9	33	9900	2·56
14100	29·0	32·5	33·0	33·0	31·9	45	13500	2·05
—	32·0	31·0	30·0	31·0	31·0	—	—	2·20
12300	30·0	30·0	31·0	30·5	30·4	35	10500	2·36
12000	32·0	31·0	33·0	30·0	31·5	39	11700	2·19
15600	33·0	32·0	30·0	27·0	30·5	39	11700	2·43
15000	30·5	29·5	30·0	32·0	30·5	54	16200	2·84
9000	17·0	17·5	18·5	16·0	17·2	25	7500	2·10
6000	18·0	19·0	18·5	19·0	18·6	13	3900	2·02
—	15·5	15·0	16·5	17·0	16·0	—	—	3·30
4200	15·5	16·0	17·0	17·5	16·5	13	3900	2·52
4500	16·0	15·5	15·5	16·0	15·8	10	3000	2·26
7800	18·0	17·0	18·0	20·0	18·2	22	6600	2·74
4500	15·0	15·5	16·5	16·5	15·8	14	4200	2·53
7800	18·0	17·0	17·0	17·5	17·4	22	6600	2·45
6000	20·0	20·0	20·0	19·0	19·8	21	6300	1·89
4200	15·0	16·5	16·0	16·5	16·0	12	3600	2·56
—	18·0	18·0	15·0	17·0	17·0	—	—	2·50
4200	15·0	16·0	15·0	15·0	15·2	11	3300	2·54
3900	17·5	17·5	16·0	17·0	17·0	13	3900	2·62
3600	16·0	16·0	16·0	16·0	16·0	11	3300	3·25
4500	15·0	15·0	14·5	15·0	14·9	9	2700	2·74
3600	16·0	15·0	15·5	15·5	15·5	13	3900	2·61
3900	19·0	18·0	16·5	18·0	17·9	19	5700	2·12
7200	20·0	19·0	19·5	19·0	19·4	25	7500	1·91
3600	16·0	15·0	15·0	15·0	15·2	13	3900	2·87
—	—	—	—	—	—	—	—	—
6900	20·0	15·0	14·5	14·0	15·9	14	4200	2·45
6000	14·5	15·0	18·0	15·0	15·6	24	7200	2·36
34800	25·0	27·0	29·5	27·5	27·2	124	37200	4·62
32100	28·0	27·0	27·5	27·0	27·4	116	34800	5·53

from the metrical measurements given by Miss Murray.

10.

THE COLOURING MATTER OF THE MUMMY CLOTHS.

By Julius Hübner, M.Sc.Tech., F.I.C.

Microscopic Examination.

THE microscopic examination, both warp and weft threads, showed that linen was exclusively used in the manufacture of all the cloths. A few fibres exhibiting the characteristics of China grass or nettle fibres were found among the linen fibres. These were probably derived from plants growing among the flax. The characteristic linen bulbs appear in many instances widened, and they are frequently torn or burst and similar in appearance to linen fibres which have been treated in the beating engine for the manufacture of paper. Bulbs of this description are not to be found in modern linen fabrics, and, whilst the tearing and bursting of these bulbs in the manufacture of paper is solely attributed to the mechanical action of the knives in the beating engine it is very probable that the disintegration in the case of the bulbs noticed in the mummy cloths is due to chemical decomposition

The Colour of the Cloths of the Mummy of Nekht-Ankh.

The wrappings of mummy No. 1 may be divided into four distinct groups in accordance with their colour:—

A.—Nos. 1 to 17 inclusive, have not been dyed, but a trace of the yellow colouring matter found in the other cloths may be extracted from some of them. This may be readily explained on the assumption that the colour of the heavily dyed cloths when moist has penetrated into the undyed cloth with which it has been in contact. The heavy loading with mineral matter of these cloths is clearly visible on the surface in the shape of whitish patches.

B.—Nos. 42, 41, 39, 38, 36, 35, 29, 27, 24 and 19 are of a light bright yellowish shade. A bright yellow colouring matter is readily extracted by boiling water. After this extraction the fabrics exhibit the appearance of old unbleached linen.

C.—Nos. 22, 23, 28, 30, 31, 32 and 34 are of a much darker yellowish brown than B and they contain a dark brown stripe.

D.—20 and 21 are of a dark yellowish brown colour similar to the lighter parts of the striped patterns C. On boiling C and D with water a light yellow colouring matter is extracted, after which the patterns appear of a greyish brown colour, the striped being still distinctly visible.

The Colour of the Cloths of the Mummy of Khnumu-Nekht.

The wrappings of mummy No. 2 may be divided into three distinct groups:—

1.—Nos. 27 to 52 inclusive, 4, 5, 6, 7, 8, 12 to 21 inclusive, are all of a heavy yellowish brown colour and practically identical in shade with the patterns under C and D of mummy No. 1.

2.—Nos. 23, D, E, F, G are of a light yellow shade and very similar to fabrics B of mummy No. 1.

3.—Nos. 10 and 11. The colour of these two fabrics is quite distinct from that of the other wrappings. It is of a rich and more solid yellow than the others.

It should be pointed out that whilst there are eighteen wrappings of mummy No. 1 which are undyed, all the wrappings of mummy No. 2 are coloured.

Moisture and Ash.

The amount of moisture present in the cloths was ascertained by drying samples at 100°C. The dried samples were then incinerated to ascertain the amount of ash.

MUMMY 1.—	Moisture in per cent.	Ash in dry cloth in per cent.
A	9·1	19·8
B	5·4	2·6
C and D	5·2	light coloured parts 3·7
		dark coloured parts 3·5

MUMMY 2.—	Moisture in per cent.	Ash in dry cloth in per cent.
1	4·6	2·0
2	5·0	1·7
3	4·8	5·5

Analysis of the Ash.

A.—Contains large quantities of alumina, lime, magnesia, iron, sodium, sulphates, and chlorides.

B.—Contains small quantities of alumina, lime, magnesia, iron, sulphates, and chlorides.

C and D.—Contain alumina, lime, iron and chlorides, whilst only traces of magnesia and sulphates can be detected.

1 and 2.—Contain alumina, lime, iron, magnesia and sulphates.

3.—The ash consists chiefly of large quantities of iron and of lime, and of traces of magnesia, chlorides and sulphates.

A.—The undyed cloths contain a very high percentage of ash and of moisture, and it may therefore be assumed that these wrappings have either been loaded with salts in the operation of finishing the woven cloths or that the threads have been prepared and loaded previous to the weaving.

The latter suggestion is probably the correct one, because finishing or loading of the yarn seems to have been practised in Egypt at an early period, for I find it stated[1] that when the skeins are very dry, they are again washed in the whey which runs from cheeses, and which in Arabic, is called "Mesch." This is a sort of stiffening that improves the cloth, and when the Egyptians handle a soft cloth they say that it wants "mesch."

The amount of ash present in B, C, D, 1 and 2 is so small that presumably these materials have not been impregnated or finished after the dyeing, further, the colouring matter would not have resisted such a treatment as it is not properly fixed upon the fibres. It will be shown later that it is much more probable that salts have been added in the dyeing of the material.

It has been stated that in accordance with burial laws the cloths used for the wrapping of mummies had to be impregnated with certain substances shortly before being used for this purpose. The flax fibre in its natural state contains a certain amount of ash and the total amount of ash found in these wrappings is so small that it seems very improbable that the dyed wrappings have been specially impregnated. Dr. Paul Haas in his Report on the Chemical Analysis of these mummies points out that Khnumu-Nekht's mummy contains abnormally high percentages of lime. He concludes that "the lime must have been introduced from without." It seems very probable that the lime has been introduced through fibre residues containing the lime having become mixed with the samples which have been analysed. This may also explain the presence of alumina which has been found by Dr. Haas in the mummies, and which he states "is not a normal constituent of the body." All the different cloths contain alumina, and it is certain that aluminium salts were used at a very early date as mordants for the purpose of fixing vegetable colouring matters upon the fibres.

(1) "The Cyclopædia, or Universal Dictionary of Arts, Sciences and Literature," by Abraham Rees, London, 1819, vol. 24, Article "Natron."

Examination of the Yellow Colouring Matter.

The yellow colouring matter contained in the dyed cloths with the exception of Nos. 10 and 11 of mummy No. 2 cannot be extracted by boiling with absolute alcohol but is readily extracted by hot water. Samples of all the cloths of both mummies were separately extracted with absolute alcohol in a Soxhlet apparatus for three hours. In every case the alcohol exhibits a strong yellowish brown coloration.

Mummy of Nekht-Ankh—The alcoholic extract was evaporated on the water bath and a brown residue, possessing an aromatic odour was obtained. This residue remains in a semi-solid condition, due to the presence of fatty matter, but it consists chiefly of a rosin which can be readily saponified.

Mummy No. 2—The alcoholic extract was treated similarly to that obtained from No. 1 mummy, and a solid residue was obtained consisting of rosin. The fatty matter is, however, entirely absent in this instance. It should be pointed out that the rosinous matter is very unevenly distributed on some of the wrappings. One and the same bandage contains a large amount of rosin in certain places, whilst it is entirely absent in other parts. By far the greater number of the bandages are entirely free from rosin. We may therefore conclude that the rosin was not employed in the preparation of the cloth but that it was used in the process of embalming the body and that it has afterwards penetrated into the bandages.

On examination of the fabrics which had been extracted with alcohol it was found that the yellow colouring matter had not been attacked. After this the fabrics were extracted for three hours in the Soxhlet apparatus with water. Practically all the yellow colouring matter was removed and the colour of the cloths after this extraction is similar to that of old unbleached linen.

The water extract from mummy No. 1 froths very strongly whilst the same extract from mummy No. 2 is free from frothing. As pointed out by Professor Dixon, the frothing of the solution is due to the presence of a soap. It is probable that the soap was introduced in the finishing of the heavily loaded cloths (A).

Yellow Colouring Matter.

The examination of the yellow organic colouring matter contained in the water extract yielded the following results:—The colour of the extract from Mummy No. 2 is slightly lighter than that from No. 1, but the colouring matters in both solutions were found to be identical. The fact that the colouring matter is so readily removed by boiling water proves that the cloths were simply impregnated with the colour solution, and dried afterwards, and that the fibres were mordanted previous to dyeing. It will, however, be pointed out later that it is very probable that salts were added to the colour solution with a view of either altering the shade of the colour or of increasing the affinity of the linen fibres for the colouring

matter. The dyeing of textile fibres has, without doubt, been practised in most ancient times. Mummy cloths are said to have been found containing coloured threads which may have been in the dyers' hands in Egypt 1,000 years before the Christian era.[1]

James Thomson, F.R.S., of Clitheroe,[2] "examined numerous mummy cloths, some of which had a border of blue and fawn colour made by coloured threads introduced into the loom. The blue was proved to have been dyed with indigo. Other specimens of mummy cloth of a reddish colour appeared to have been dyed with safflower, though this colouring matter could not be recognised with the same certainty as indigo." He states further that "Carthamus has long been an article of cultivation in Egypt. . . . It has been cultivated and used for ages." He also draws attention to a narrow slip of cloth of a yellowish colour, of which he thinks that there is little doubt of its being identical with the yellow colouring matter which it is possible to extract from Carthamus with water. Edward Schunk, F.R.S., in "Notes on some Ancient Dyes,"[3] gives the results of the examination of a number of mummy cloths from a lot found by Professor Flinders Petrie in a tomb at Gurob, supposed to date from 400 to 500 A.D. He ascertained the different colouring matters which had been employed in the dyeing of the fabrics, with the exception of the yellow, of which he expressed a doubt as to whether analysis would lead to any precise results. The yellow organic colouring matter contained in the water extract of the cloths of both mummies proved on examination to be identical with the yellow colouring matter extracted from the Carthamus (Bastard Saffron, Safflower, *Carthamus tinctoria*). The flower contains two colouring matters—the yellow, which is very soluble in water, and the red, which is insoluble. According to Dufour[4] 1,000 parts of the flower contain 244 parts of the easily soluble yellow colouring matter, whilst they only contain a small amount of the red colouring matter. For the purpose of obtaining the red colouring matter the Safflower had to be repeatedly treated with water, so as to remove all the yellow. Whilst the red colouring matter has been extensively employed in Europe in dyeing cotton previous to the introduction of the coal tar colours, the yellow colouring matter of the Safflower, being exceedingly fugitive, seems to have always been washed away. Reference is made by M. Berthollet[5] to this colouring matter. It is stated that "the Safflower grows abundantly in Egypt. The yellow substance might, however, be employed, and Mr. Peerner[6] has made many experiments on the subject. The principal results of his experiments were, that wool, without any preparation, takes from it a yellow colour, which is not permanent; but that which it takes after having been prepared with alum and tartar, though not very lasting,

(1) Encyclopædia Britannica, ed. 9, vol. 7, p. 571.

(2) *Lond. and Edin. Phil. Mag.*, vol. 5, p. 355.

(3) *Mem. Proc. Manchester Lit. & Phil. Soc.* (4), vol. 5, 1892, p. 158.

(4) J. Persoz, Traité théorique et pratique de l'impression des tissus, 1846.

(5) Elements of the Art of Dyeing, vol. 2, 1791, p. 230, translated by W. Hamilton, M.D.

(6) Chemische Versuche und Bemerkungen zum Nutzen der Farbekunst, dritter Theil.

is better. Mr. Beckmann asserts that cloth prepared with tartar or with tartar and alum acquires from it a good yellow colour, and that Carthamus contains more yellow colouring matter than an equal weight of fustic itself."

Although it appears, therefore, that attempts have been made to employ the yellow colouring matter of the Safflower for dyeing wool, it does not seem to have been employed in Europe for dyeing cotton or linen fabrics.

The following extracts[1] seem to be of considerable interest in that they prove that the yellow colouring matter of the Safflower is still extensively employed in dyeing silk, and, no doubt, was employed in ancient times for this purpose in the East. Among the various dyestuffs which are used we find the following reference to Safflower :—" 3. Kusum (Safflower, *Carthamus tinctorius*), for yellow or red ; a vegetable dye. At one time Kusum plants played a considerable part in provincial agriculture, but they are now distinctly on the wane." A further reference to the Safflower colours is found under 173 : —" Karaundiyá (puce), bádámi (light buff), and náranji (orange) are colours usually produced by means of Kusum." That the Safflower colours must have been of considerable importance in early times in the East is also shown in the following :—" 316. Benares. Pitambar, or Pitambari, is a very superior class of dhoti, worn on festival days and at meal-times by better class Hindus, by boys, men and women. Always of pure silk throughout, and generally of a pink, yellow, or Safflower colour. It is much affected in the picturesque Sáwan popular festivals. The bigger pitambar pieces of Safflower colour are worn as sáris by women in the swinging festival, and are referred to in this connection in the Bárámásá Rádhiká :—

(Which may be translated)

" 'Sáwan, dear, must have its due ;
See Sukhya already on the swing ;
Clad in folds of Safflower hue,
Behold the loved one of the ring,
Radha, merrily, merrily swing.' "

The yellow colouring matter of the Safflower has, therefore, without doubt, been employed extensively for the dyeing of fabrics in the East in ancient times. Its extreme fugitiveness accounts for the fact that materials dyed with this colouring matter have only been found among mummy wrappings which have been kept out of contact with the air and the light. It has been suggested by some investigators that all the linen cloths were saved for the purpose of being ultimately used as mummy bandages. This may be correct, but, considering that the cloths from the two mummies are very evenly dyed, it seems to be certain that they were specially dyed with this colouring matter immediately before they were used as bandages.

(1) A Monograph on Silk Fabrics produced in the North-Western Provinces of Oudh, compiled by A. Yusuf Ali, Allahabad, 1900.

With a view to ascertain whether the yellow organic colour extracted from the mummy cloths behaved similarly in dyeing to the yellow colouring matter extracted from the Egyptian Safflower of the present day, a series of experiments was carried out in which the dye, mordanted with the various mordants, was employed on cotton cloth. The principal natural yellow organic colouring matters were also dyed on these mordants, and the following results obtained :—

Double Mordant of Iron and Aluminium.—Safflower yellow and the two extracts from the mummy cloths dye very faintly only on this mordant. Quercitron bark extract, Persian berries, Fustic extract and Weld dye much more strongly.

Iron Mordant.—Safflower yellow dyes a yellowish brown, identical with the shade produced by dyeing with the extract from Mummy No. 1. The extract from Mummy No. 2 dyes a slightly duller shade. As pointed out before, these cloths contain, however, appreciable amounts of magnesium sulphate, and it was found that the identical shade is obtained by dyeing with Safflower yellow if an addition of this salt is made to the dyebath. Quercitron bark, Persian berries, and Weld produce olive brown shades on this mordant, which are quite distinct from the shades produced by either the Safflower yellow or the extracts from the mummy cloths. Fustic extract produces a darker brown on this mordant.

Aluminium and Tin Mordants.—Safflower yellow and the extracts from the mummy cloths exhibit little affinity for these mordants, whilst all the other yellow colouring matters dye strong yellow shades on these mordants.

It has, therefore, been conclusively proved that the yellow organic colouring matter used in dyeing the mummy cloths is identical with the yellow colouring matter derived from the Persian or Egyptian Safflower.

It has been pointed out that the two bandages, Nos. 10 and 11, from Mummy No. 2 contain a very high percentage of ash, and that their yellow colour differs distinctly from that of the other bandages. On boiling these two fabrics with water, a trace of the yellow organic colouring matter is removed, whilst the heavy, rich yellow colour itself is not affected. The colour is not attacked by alkali; it resists the action of a strong solution of bleaching powder, and is not affected by boiling soap solution; it is, however, attacked by weak boiling hydrochloric acid. The yellow organic colouring matter of all the other cloths is rapidly destroyed by weak bleaching powder solution. On boiling the two patterns with logwood extract a black is produced.

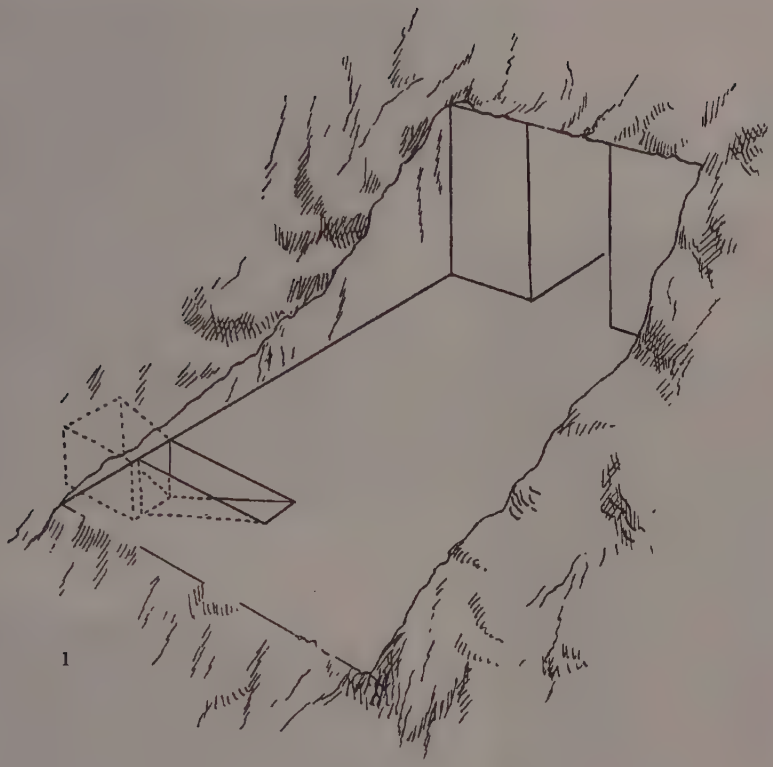
The microscopical examination of these two fabrics shows that the oxide of iron is very finely and very evenly distributed on the surface of the fibres. It is, therefore, established that the two cloths have been dyed with iron buff. The presence of a considerable quantity of lime in these two bandages further points to the probability that calcium hydrate has been employed to develop the iron buff.

Cloths dyed with this very fast colour will probably have been much more costly than those dyed with the fugitive yellow of the Safflower. This might, perhaps, account for the fact that among the great number of cloths from Mummy No. 2 there are only two which have been dyed with this colour. The texture of these two wrappings being very fine, it might be of interest to draw attention to the following remark:—"Besides the Tyrian purple, scarlet, and the varieties and compounds of these colours, Pliny mentions yellow as a very ancient dye, and highly esteemed in former times. The veil which the bride wore on her wedding day was of yellow, and none but women were permitted to use it. They had also a colour resembling the cyanos, or blue bottle, and another like the golden yellow flower Elichryson."(1)

Dr. Budge, of the British Museum, kindly presented me with two patterns of cloth from the mummy of Heni, Al-Barshal [El Bersheh?], of the twelfth dynasty. They were found to contain traces of iron, alumina, and lime, and the yellow colouring matter of the Safflower could be extracted from both of them by boiling with water. The colour of the two patterns closely resembles that of the darker coloured bandages of both mummies.

On comparing my results with those of my colleague, Mr. Fox, I find that he arrived independently at the same conclusions: (*a*) that the material is linen throughout, and (*b*) that in the classification of the wrappings found on Mummy No. 1, No. 1—1F are looser, undyed, of fine texture, and that they were nearest the body.

(1) Universal Dictionary of Arts, Sciences, and Literature, by Abraham Rees, London, 1819, vol. 12, article "Dyeing."



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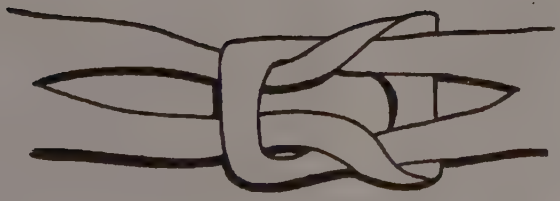
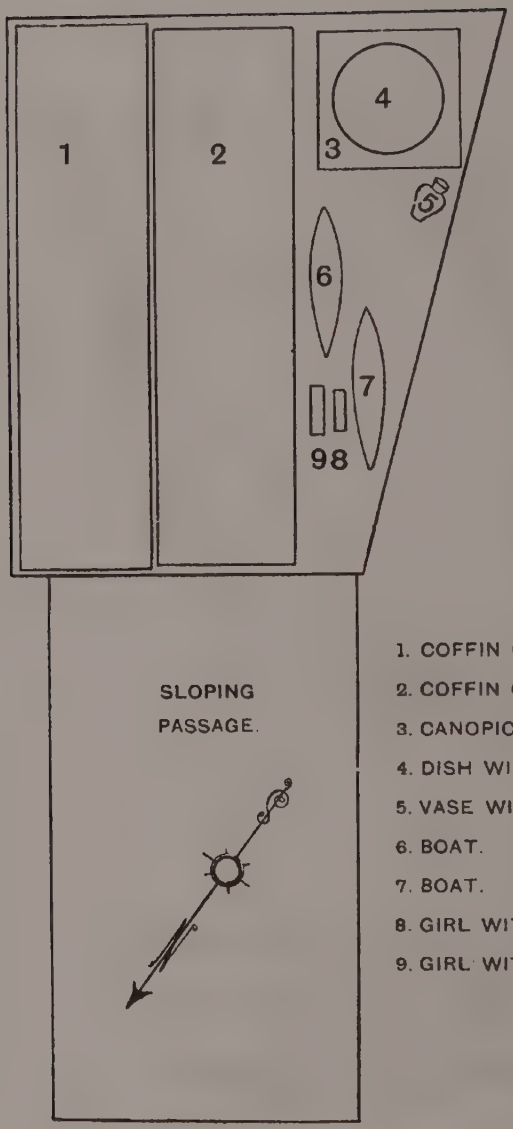


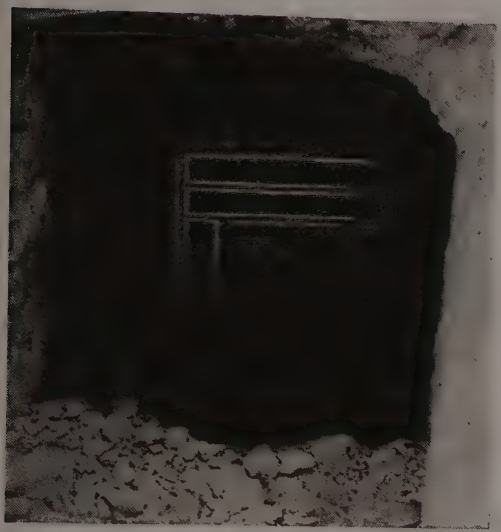
2

1. Perspective View of Courtyard and Tomb, drawn to scale.
2. Diagram of Knots in Bandages.

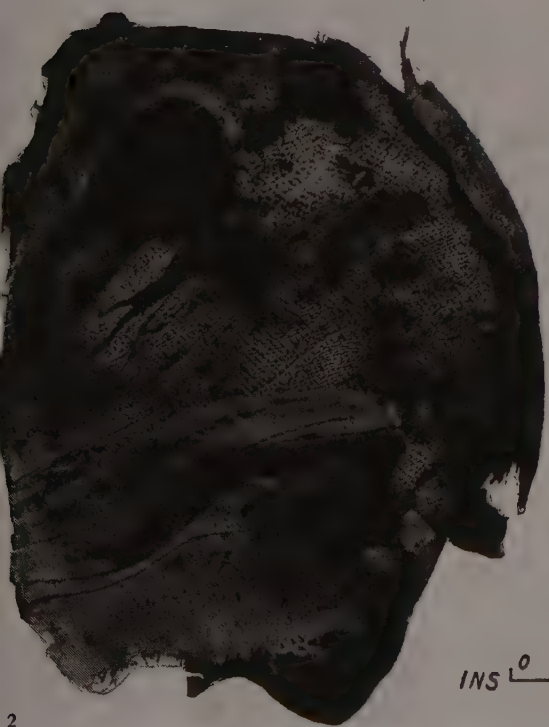


1. COFFIN OF KHNUMU-NEKHT.
2. COFFIN OF NEKHT-ANKH.
3. CANOPIC CHEST.
4. DISH WITH LEAVES.
5. VASE WITH LEAVES.
6. BOAT.
7. BOAT.
8. GIRL WITH OFFERINGS.
9. GIRL WITH OFFERINGS.

Plan of Tomb



J. R.



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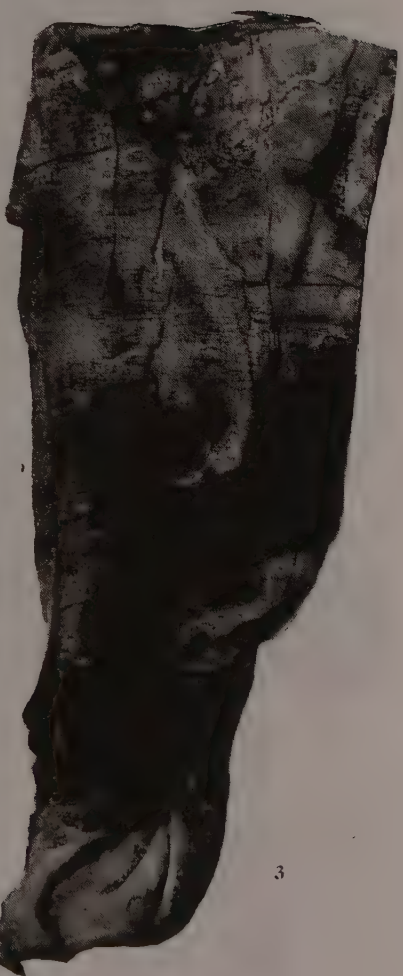


3

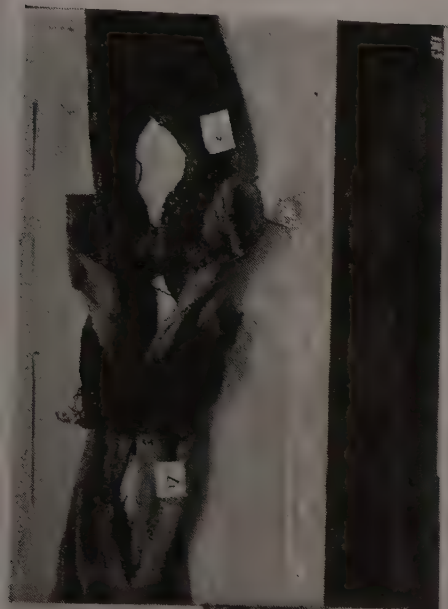
J.W.J

1. The Coffins *in situ*.
2. Head Bandages of Khnumu-Nekht.

1. Leaves and Stalks. 2 2. Dish.

J.W

Plate 6.



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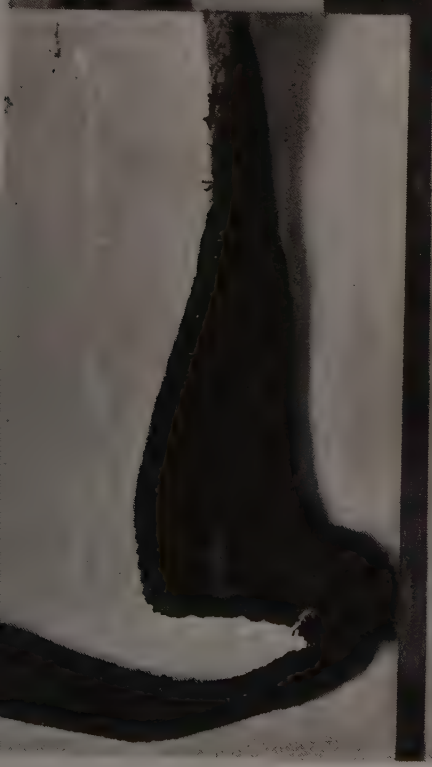


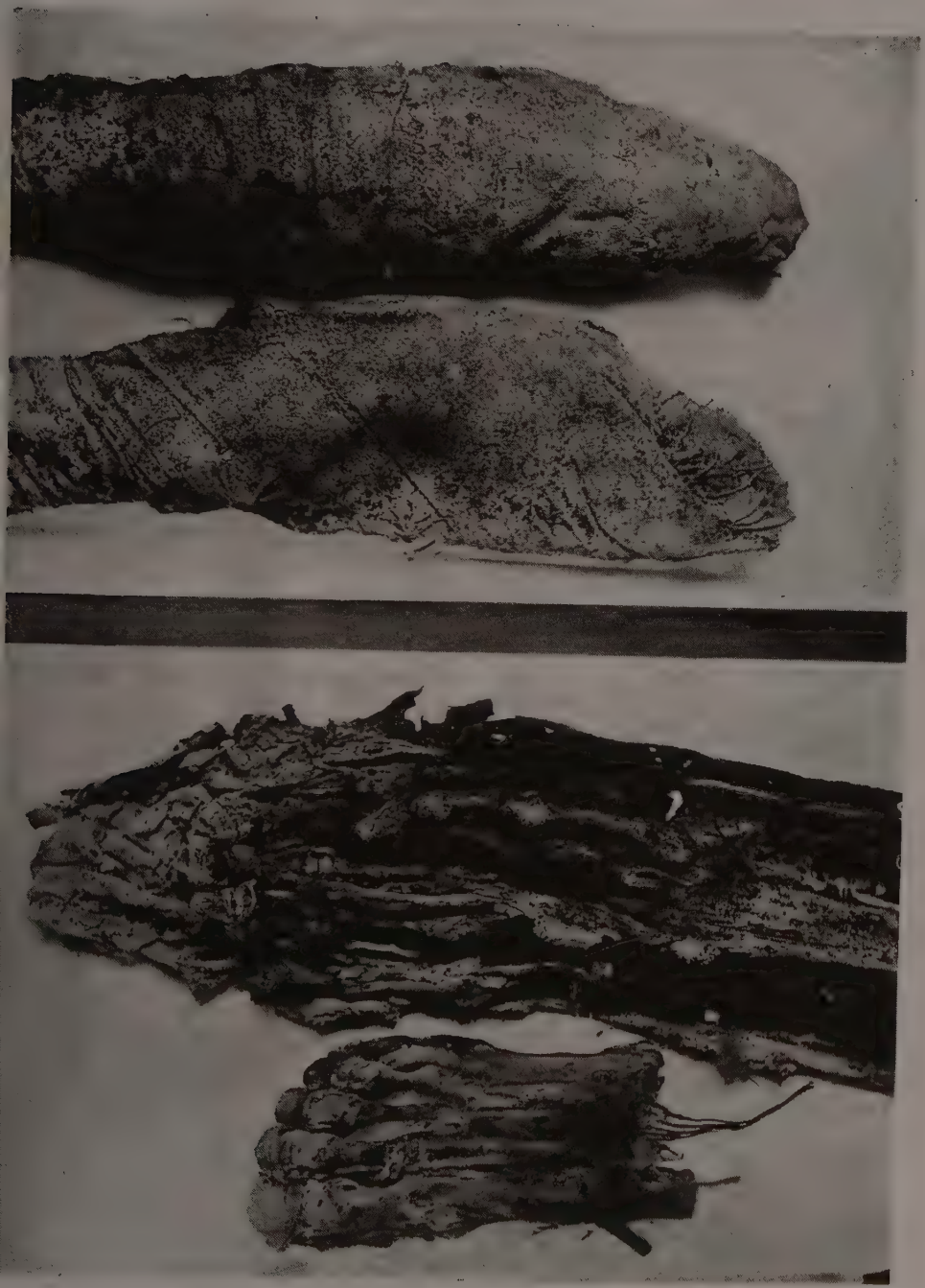
4

1. Knot in Bandages of Nekht Ankh.
2. Feet of Nekht Ankh showing wrappings.
3. Bandage No. 26 of Khnumu-Nekht.
4. Fibre Matting from chest cavity of Nekht Ankh.

J.W.J.

1. Bandage No. 35 of Khnumu-Nekht.

J.W.J



J.W.J.

1. Hands of Nekht Ankh showing wrappings.

Photo-Micrographs of the Fibres.

Mummy of Nekht-Ankh at various stages of unwrapping.

W. G.

FIG. 1.

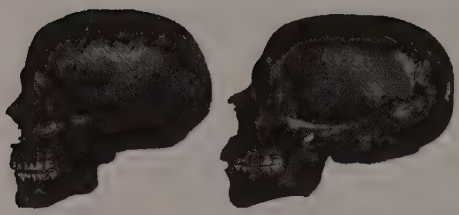


FIG. 2.

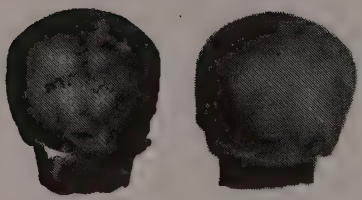


FIG. 5.

FIG. 4.

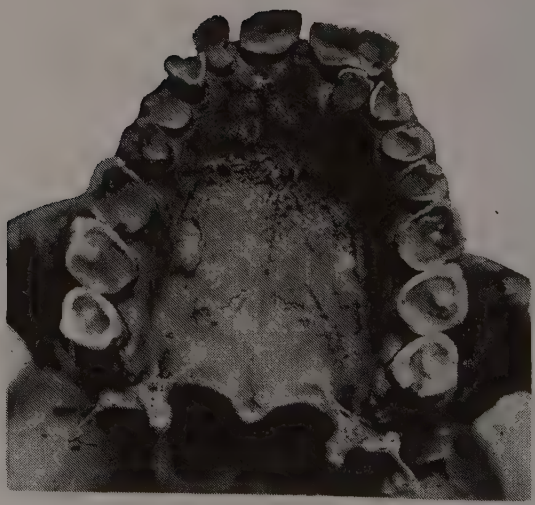
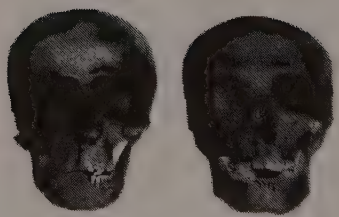


FIG. 3.



Anatomy of the Mummies.

J.W.

FIG. 6.

FIG. 7.

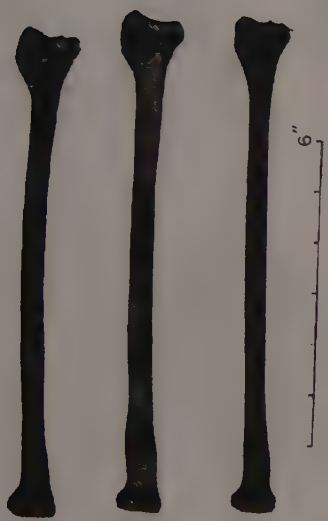


FIG. 8.

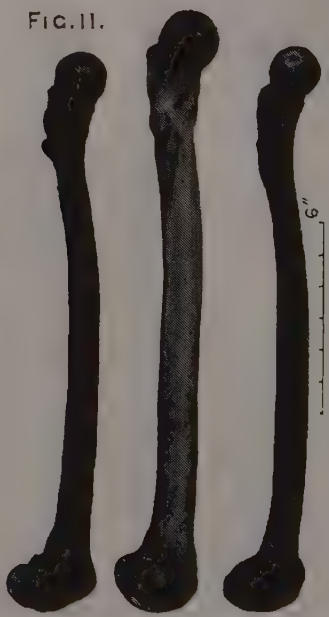
J.W.J.

Anatomy of the Mummies.

FIG. 9.

FIG. 10.

FIG. 11.



Anatomy of the Mummies.

J.W.

Fig. 12.

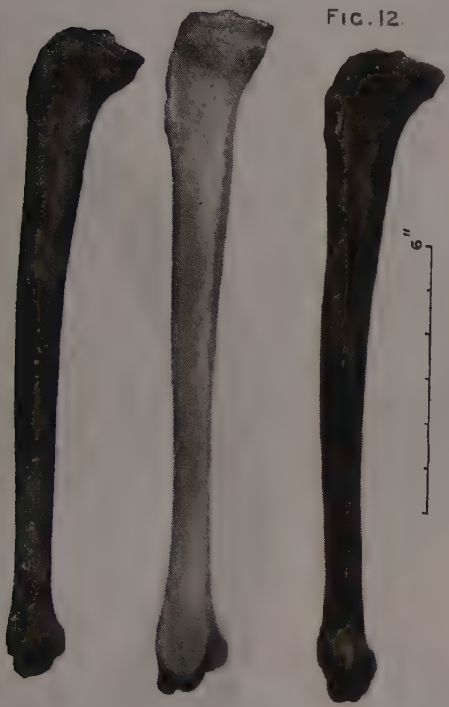


Fig. 13.

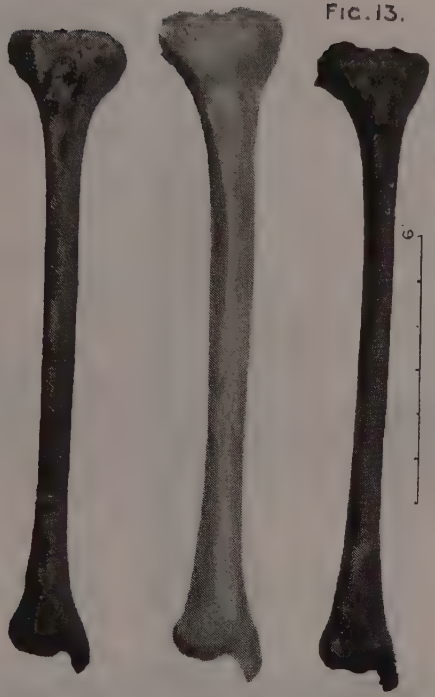


Fig. 14.

J.W.J.

Anatomy of the Mummies.

FIG. 15.

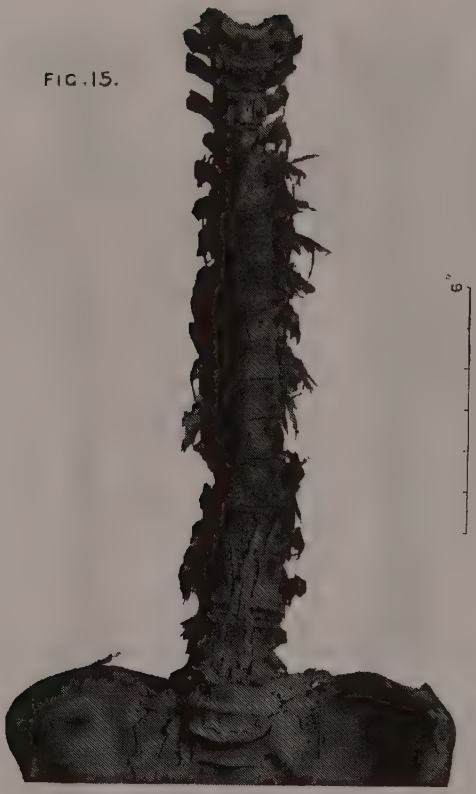


FIG. 16.

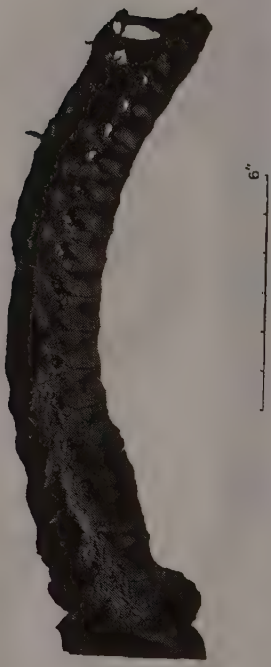
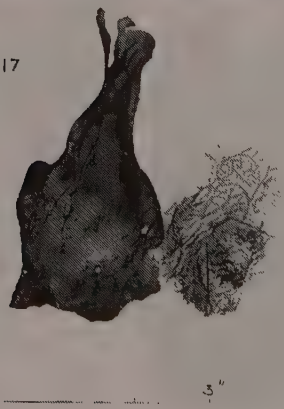


FIG. 17



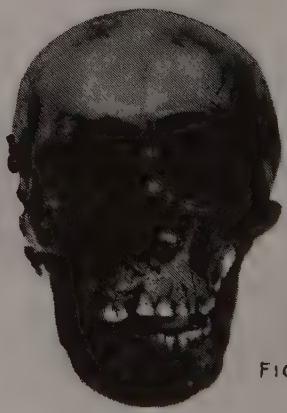


FIG. 18.

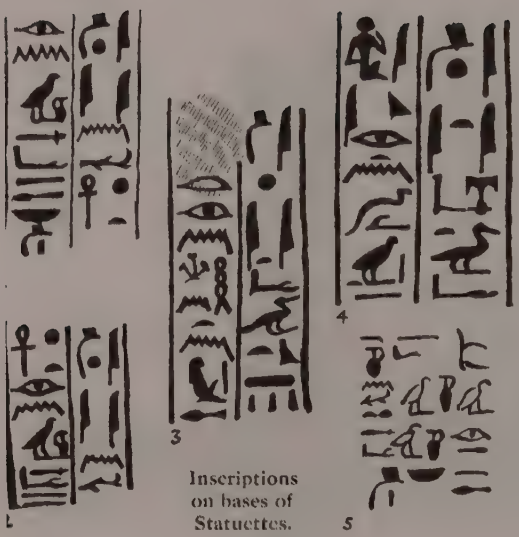
Anatomy of the Mummies.

J.W.J

Funeral Boat going down stream.

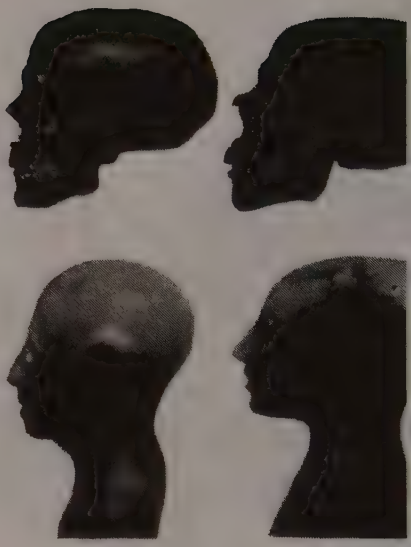
Funeral Boat going up stream.

W. G.



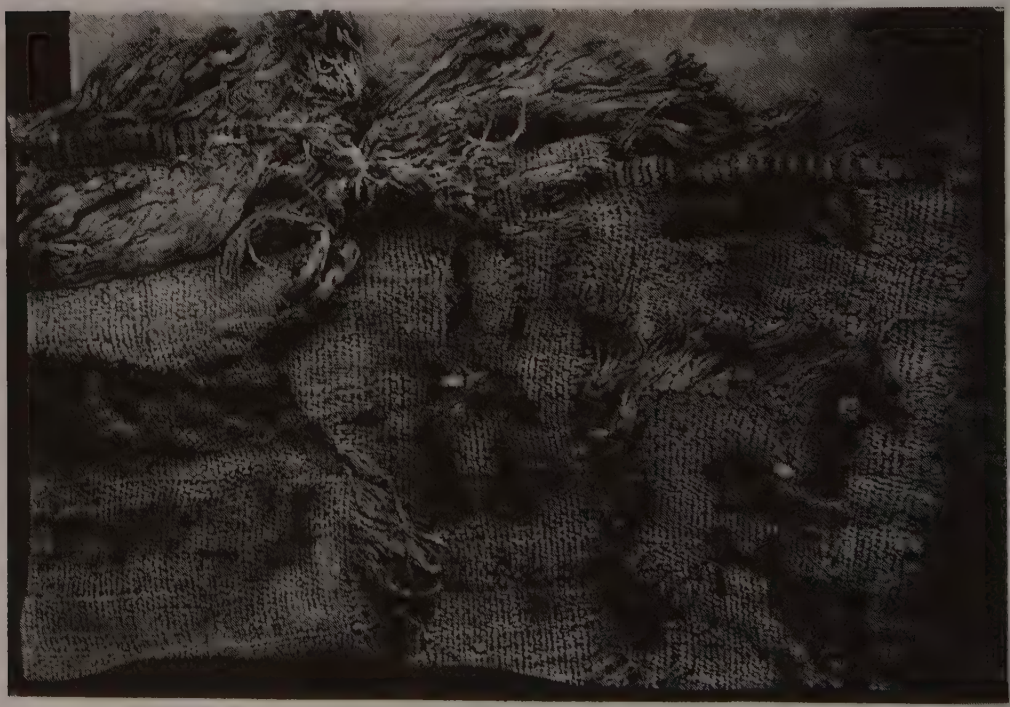
Inscriptions on bases of Statuettes.

1, 2. Nekht-Ankh.
3. Larger Offering Girl.
4. Smaller Offering Girl.
5. Khnumu-Nekht.

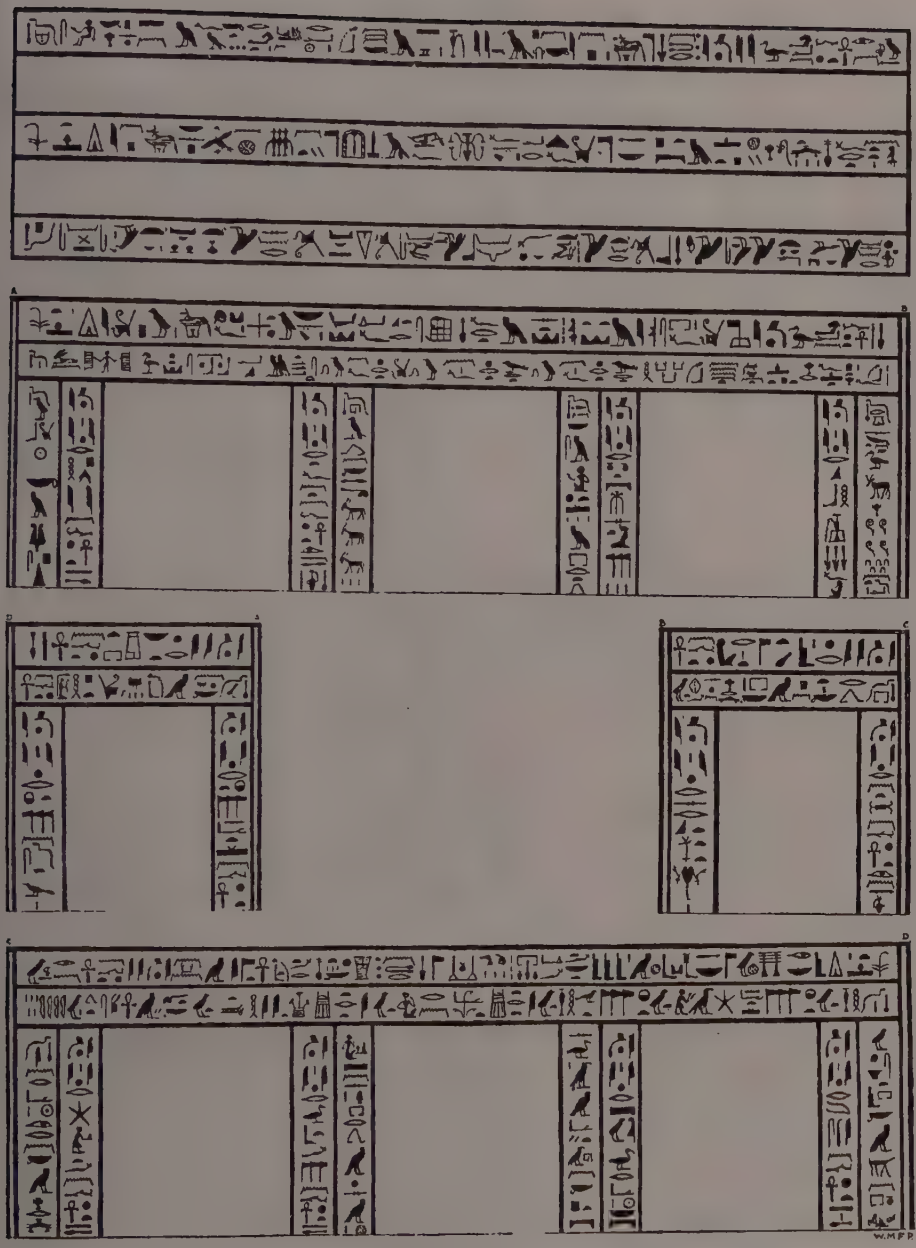


Profiles of Skulls and Statuettes.

6. Nekht-Ankh.
7. Khnumu-Nekht.

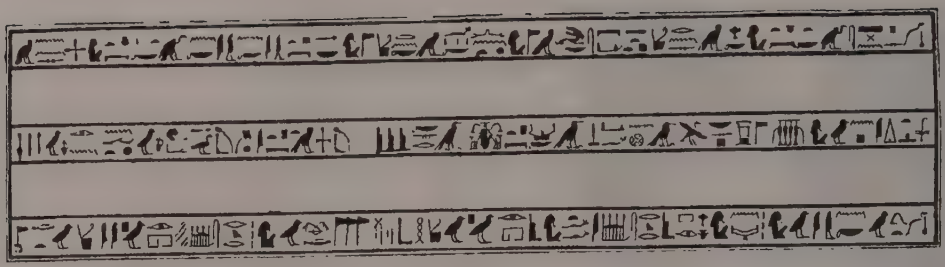


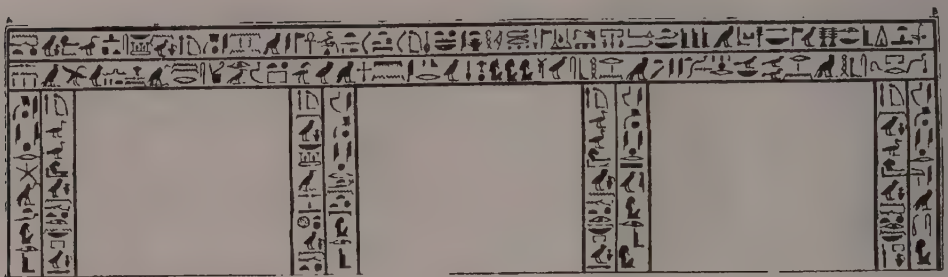
Ink-written Inscriptions on Bandages.



Inscriptions on Coffin of Nekht-Ankh.

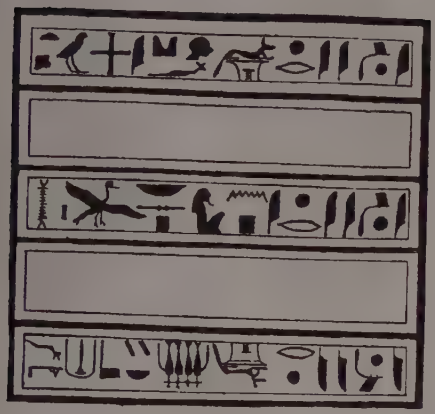
1. Lid.
2. Right side.
3. Head end.
4. Foot end.
5. Left side.

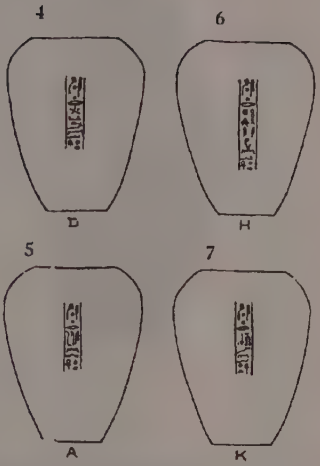


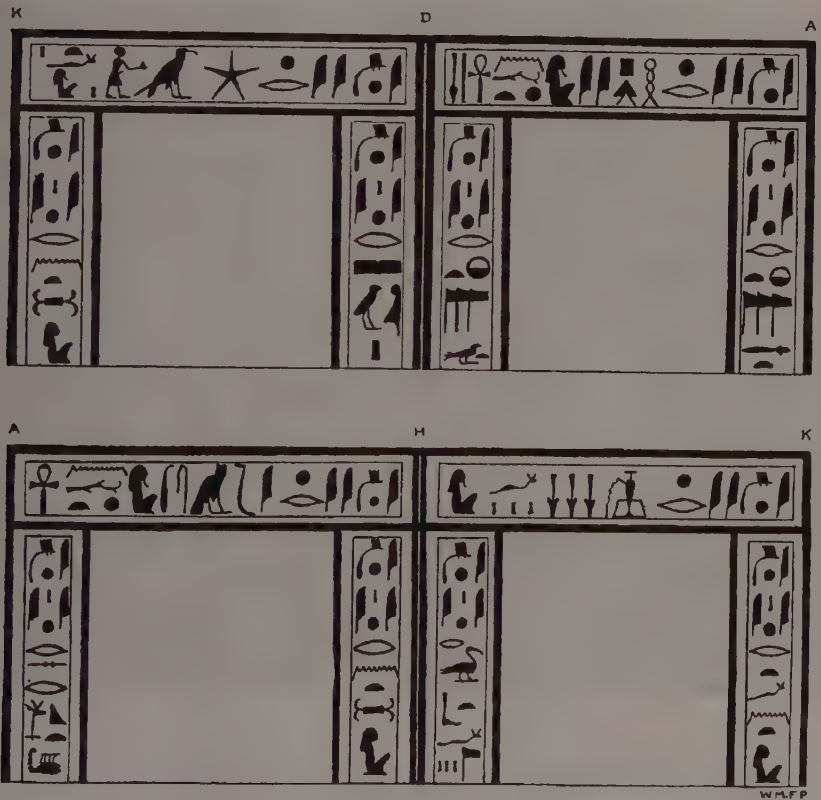


Inscriptions on Coffin of Khnumu-Nekht.

1. Lid.
2. Left side.
3. Foot end.
4. Head end.
5. Right side.







1. Lid of Canopic Chest.
2, 3. Sides of Canopic Chest.
4, 5, 6, 7. Canopic Jars.
8. On Body-case of Khnumu-Nekht.
9. On Body-case of Nekht-Ankh.

1 A 2 D 3 K 4 H

Canopic Jars of Nekht-Ankh.

5 6 7 8 9

5. 6. Offering Girls. 7. Khnumu Nekht.
8, 9. Nekht-Ankh.

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